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PHYSICIAN STUDIES:
GROWTH IN PHYSICIAN SERVICES

Final Report

Prepared for:

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1. INTRODUCTION

Since its inception in 1965 the Medicare program has been plagued by increases in its budget, increases which have become even more dramatic in the last decade. Initial reform activities were focused on payments for hospital costs, the largest percentage of the Medicare budget. These activities culminated with the introduction in 1983 of a new way of paying for hospital stays, Diagnostic Related Groups (DRGs). After DRGs were introduced, attention began to focus on the second largest component of Medicare costs -- physician payments.

From 1978-1987 Medicare payments for physicians' services have increased at an annual rate of 16%.[1] In 1987 Medicare expenditures on physician services were $22 billion, 27% of the Medicare budget.[2] Physician expenditures increases over the last 10 years can be decomposed into three causes: (1) increases in the number of beneficiaries; (2) increases in payments per services; and (3) increases in service use and shifts from less expensive to more expensive services. Growth in number of eligibles is estimated to account for 15% of the increase, increases in price for 40% and the remaining 45% is estimated to be related to changes in volume and intensity.[3]

The reality of these demonstrated increases in the last 10 years, combined with future projections of use if the increases cannot be moderated, has resulted in considerable legislation and executive attention given to physician payment reform.

In order to better understand past trends in use, HCFA has contracted with several organizations to study trends in Medicare Part B service use. This contract is part of that initiative. Its main purpose is to manipulate large HCFA data files to examine Medicare use over the time period 1986-1988.

The study focuses not only on the findings from the data presented for potential policy formation, but also on the technical investigations which were necessary to use the data provided.

Research questions to be addressed include:

- How did utilization per beneficiary (and per user), service intensity, and price change?
    - By carrier
    - By procedure group
    - By place of service
    - By specialty
    - By the assignment status of the claim

- How did utilization per beneficiary (and per user), service intensity, and price change for selected groups of procedures change?
    - Detailed procedure groups
    - Surgery related services
    - Office, hospital and consultations
    - Families of procedures
    - Selected laboratory tests

- What are the most commonly occurring procedures and those with the largest amount of allowed charges?
    - Medical
    - Surgical
    - Radiology
    - Laboratory

- How did utilization per provider number, service intensity and price change?
    - By carrier
    - By specialty
    - By procedure group
    - By place of service
    - By level of allowed charges assigned the provider number.

This report is organized as follows. In the next chapter we will develop the background to this study reviewing the legislative changes which have occurred relating to physician reimbursement and the health services research which bears on our investigations. Following that, the chapter on data sources and methodology describes the files and fields to be used in this study, examines the beneficiary and provider populations, and then reviews findings from technical investigations which guided our decisions in the creation of our analysis file. Chapter 4 discusses the findings and is organized in the same manner as the four research questions outlined above. Chapter 5 reviews the findings and policy implications and proposed future directions for study. Attachment 1 to this report consists of the tables presenting numbers of eligibles and users, RVU definitions, selected distributions of the procedure file, distributions of services with the professional component modifier, and provider distributions. Attachment 2 consists of detailed table series selected by HCFA for inclusion in this report. Attachment 3 is table of contents and user documentation for a 3-tape data file containing all possible table combinations.

2. BACKGROUND

In this chapter we discuss two areas which are important to understand to put the following chapters into perspective. These are the legislative changes concerning Medicare physician payment which were in effect during the years of the study, and findings from research studies which have been conducted on physician service utilization and reimbursement.

Change in Medicare Physician Payment

Historically, all Part B services have been reimbursed on a fee-for-service basis using customary, prevailing, reasonable charge (CPR) methodology. According to this methodology the amount allowed by Medicare, (the Medicare reasonable charge or allowed charge) is the lowest of: (1) the submitted charge; (2) the customary charge which is the physician's median charge during the previous calendar year; (3) the prevailing charge, which is the 75th percentile of all customary charges for physicians in the same specialty and the same geographic area during the previous calendar year, adjusted by the Medicare Economic Index (MEI); or (4) a charge determined to be reasonable by the Medicare carrier. The MEI reflects increases in physician office practice costs and earnings in the general economy.

In addition, physicians have been given the option of taking or not taking assignment of the claim. When a claim is assigned, the physician agrees to accept the Medicare reasonable fee as payment in full and bills Medicare directly. The Medicare program pays the physician 80% of the reasonable fee less any beneficiary deductible. The physician can bill the patient for the 20% coinsurance and any deductible. Patients not treated on assignment are responsible for the full billed amount. The patient submits the bill to Medicare and receives 80% of the reasonable charge less any unpaid deductible.

Within the last 10 years there has been heightened Congressional interest in physician payment reform. Figure 1 outlines the major legislation affecting Medicare physician payments through 1988, highlighting those provisions most pertinent to our study. The major elements listed in the table should not be considered a definitive list of the content of each bill. As can be seen in that table, since 1982 the budget reconciliation bills have included many specific changes in physician payment.

Of the substantial number of specific changes in physician reimbursement policy which could affect our study data, four are highlighted below. These are:

- The Participating Physician and Supplier (PAR) Program
- The Laboratory Fee Schedule
- Fee Freezes and Medicare Economic Index (MEI) adjustments
- Limits on Overvalued Surgical Procedures.

The Participating Physician and Supplier Program

The Participating Physician and Supplier Program (PAR) Program was created by the Deficit Reduction Act (DEFRA) of 1984 (P.L. 98-369). The program permits physicians and suppliers who sign a form voluntarily agreeing to accept assignment on all Medicare claims to be listed in a directory of participating providers and to receive advantages in billing and fee screen updates. Specifically, the physician customary and prevailing fee screen freeze from July 1, 1984 to October 1, 1985 also passed by the same legislation gave participating physicians the advantage of having their increases in actual fees during the freeze period recognized in future customary screen updates.

Figure 1

MAJOR LEGISLATION AFFECTING MEDICARE PHYSICIAN PAYMENT THROUGH 1988

Year	Bill	Major Elements
1972	Social Security Amendments of 1972 P.L. 92-603	Limited Medicare prevailing charge increases to a Medicare Economics Index (MEI) which reflects increases in physician office practice costs and earnings in the general economy.
1982	TEFRA Tax Equity and Fiscal Responsibility Act P.L. 97-248	Specified methods that hospital-based physician must bill the professional component of a hospital inpatient and outpatient hospital services provided to individuals to carriers for pricing according to the reasonable charge screens.
		Recognized a system of CMPs which provide health services to beneficiaries on a capitated basis in a manner similar but less narrowly defined than HMOs.
1984	DEFRA Deficit Reduction Act of 1984 P.L. 98-369	Created the participating physician and supplier program (PAR).
		Froze Medicare customary and prevailing fees from 7/1/84 to 10/1/85. Non-participating physicians are not allowed to increase actual amounts they bill patients during freeze period.
		Established fee schedule for laboratory services. Independent laboratories and hospitals must take assignment. Assigned services will be reimbursed at 100% of the fee schedule with no beneficiary coinsurance and deductibles.
1985	COBRA85 Consolidated Omnibus Reconciliation Act of 1985 P.L. 99-272	Extends customary and prevailing charge updates and non-PAR physicians' actual charges through 4/30/86.
		From 5/1/86 PAR physicians fee screens updated to 10/1/85 level. Non-PAR physicians fee and actual charges remain frozen until 12/31/86.

Figure 1 (Continued)

MAJOR LEGISLATION AFFECTING MEDICARE PHYSICIAN PAYMENT THROUGH 1988

Year	Bill	Major Elements
1985	COBRA85 (Continued)	Laboratory Services will be subject to carrier specific ceilings. In addition, for 7/1/86 through 12/31/87 fees are limited to 115% of national median, for 1/1/88 through 12/31/88 fees are limited to 110% of national median. Beginning 1/1/88 fees will be based on national fee schedule.
		Beginning 1/1/87 mandatory assignment for all laboratory services provided by physician's office.
		Secretary must develop a relative value scale for physician services by 7/1/89.
1986	OBRA86 Omnibus Reconciliation Act of 1986 P.L. 99-509	Established differential prevailing charge updates in 1/1/87. For PAR physician prevailing charges are those in effect 12/31/86. Non-PAR physicians are limited to 96% of respective prevailing charges levels for participating physicians.
		MEI will be updated 1/1/87, increase for 1987 is 3.2%.
		Maximum Allowable Actual Charge (MAAC) limits for non-PAR physicians beginning 1/1/87.
		If weighted average actual charge for a given service April-June 1984 is equal to or greater than 115% of the current year's prevailing charge, MAAC limit is increased by one percent. If it less than 115% of the current year's prevailing charge, the MAAC limit is increased by the fraction of the difference between the weighted average actual charge and 115% (FY87 = 1/4, FY88 = 1/3, FY89 = 1/2).
		Effective 10/1/87, surgeons performing an elective surgical procedure on an unassigned basis of >$500 must notify beneficiary in writing of the estimated actual charge and the Medicare approved charge.

Figure 1 (Continued)

MAJOR LEGISLATION AFFECTING MEDICARE PHYSICIAN PAYMENT
THROUGH 1988

Year	Bill	Major Elements
1986	OBRA86 (Continued)	Laboratory Services fee schedule delayed until 1/1/89.
		Cataract Surgery reduced by 10% 1/1/87, 2% in 1/1/88.
1987	OBRA87 Omnibus Reconciliation Act of 1987 P.L. 100-203	Fee screen year 1988 updates for prevailing and customary charges delayed until 4/1/88. MAAC limits for non-PAR doctors remain in effect until 3/31/88. Modified the sequestration order of 1987 which reduced payment to physicians services between 11/21/87 and 9/30/88 by 2.334% for the time period 12/22/87 to 3/31/88.
		Prevailing charge levels for primary care services which are less than 50% of weighted national average are raised to 50% of the national average.
		Ophthalmic ultrasound procedures limited to 5% of prevailing charges for cataract surgery with lens implant.
		Radiology fee schedule to be developed by 1/1/89.
		Beginning 4/1/88, prevailing charges for following procedures will be reduced: bronchoscopy, carpal tunnel repair, cataract surgery, coronary artery bypass surgery, diagnostic and therapeutic dilation and curettage, knee arthroscopy, knee arthroplasty, pacemaker implantation surgery, total hip replacement, suprapubic prostatectomy, transurethral resection of the prostrate and upper gastrointestinal endoscopy.
		MEI update for 1988 is 3.6% for primary care services by participating physicians, 1% for other services by PAR doctors, 3.1% for primary care services by non-PAR physicians and .5% for other services by non-PAR doctors.

Figure 1 (Concluded)

MAJOR LEGISLATION AFFECTING MEDICARE PHYSICIAN PAYMENT
THROUGH 1988

Year	Bill	Major Elements
1987	OBRA87 (Continued)	Relative value guide should be established to pay for anesthesia services, a resource based fee schedule for radiology services, and a relative value scale for pathology services.
		Physician who orders but does not perform or supervise a diagnostic test is limited to the lower of the actual charge or the supplier's reasonable charge.
		Effective 4/1/88, coinsurance and deductibles previously waived on surgical procedures in hospital outpatient departments or ambulatory surgery clinics is reinstated.
		Clinical laboratory diagnostic tests are frozen at 1987 level for 1/1/88 - 3/31/88. Automated tests are rebased for 1988.

COBRA extended the freeze through April 30, 1986 and on May 1, 1986 updated fee screens for PAR physicians to October 1, 1985. Fee screens for non-PAR physicians remained frozen until December 31, 1986. OBRA86 established differential prevailing charge updates: one update for PAR physicians and one update for non-PAR physicians. Beginning January 1, 1987, prevailing charges for PAR physicians were based on the prevailing charge in effect December 31 of the previous year. Non-PAR physicians prevailing charges are limited to 96% of the respective prevailing charge levels for PAR doctors. Maximum Allowable Actual Charge (MAAC) limits for non-PAR physicians began January 1, 1987. Given the freeze on actual charges for non-PAR physicians, the base period for the 1987 MAAC limit was April - June, 1984. The MAAC for each service is calculated as follows. The weighted average actual charge for a service in the base period is compared against 115% of the current year's prevailing charge. If the weighted average actual charge is equal to or greater than 115% of the current year's prevailing charge, then the MAAC limit is increased by a fraction (FY87 equals 1/4, FY88 equals 1/3, FY89 equals 1/2) of the difference between the weighted average actual charge and the 115% threshold. Service specific MAAC limits were enacted in April, 1988.

OBRA86 also provided additional incentives for physicians to become participating physicians. After October 1, 1987, for elective surgery procedures of more than $500 delivered on a non-assigned basis, physicians must provide the beneficiary in writing the estimated actual charge, the approved Medicare charge and the balance due to the physician.

OBRA87 provided for differential updates to the prevailing and customary charges levels for PAR and non-PAR doctors. It also provided differential updates to fee screens for reimbursement of primary care services. For PAR physicians, the MEI update for 1988 was 3.6% for primary care services and 1% for all other services. For non-PAR physicians, the MEI update was 3.1% for primary care services and 0.5% for all other services. In 1988, non-PAR doctors prevailing charges will be no more than 95.5% of the prevailing charges for PAR physicians. The percentage was reduced to 95% in 1989. Effective 1989 the MEI update for PAR physicians was 3% for primary care services and 1% for all other services. For non-PAR physicians it was 2.5% for primary care services and 0.5% for all other services.

The Laboratory Fee Schedule

The 1986-1988 period of the study encompassed many significant changes in Medicare reimbursement strategies for laboratory procedures. Some changes in 1984 set the stage. These included setting carrier fee schedules at 60% and 62% of prevailing charges for lab tests beginning July 1, 1984, and mandating assignment (at 100% reimbursement) for non-physician billers. But the momentum built in 1986 when COBRA required national limitation of laboratory amounts effective July 1 of that year. Pricing lab procedures became, in effect, a three step process. Carriers paid charges on the basis of the lesser of the submitted charge, the carrier's fee schedule amount, or the national limitation amount.

During the study period, both carrier prevailing fees and the national limitations were increased to reflect changes in the Consumer Price Index (CPI). Lab fees for the July 1, 1986 to December 31, 1986 period (Study Year 1) were increased by 4.1% over fee screen year 1985. Study Year 2 (1987) fees were increased by 5.4%. However, Study Year 3 (1988) fees were not increased by a CPI adjustment. At the same time, the national limitations were imposed and tightened. For services from July 1, 1986 through December 31, 1986 (Study Year 1), the national limitation amount was set at 115% of the median of all fee schedules. For the period January 1, 1987 through March 31, 1988 (Study Year 2 and first quarter Study Year 3), the limitation was lowered to 109.6% of the median. Finally, effective April 1, 1988 (most of Study Year 3), the limitation was reduced to 100% of the median.

According to HCFA Regional Office staff, the overall effect of these two fee screens (local prevailing vs. national limitation) was that during 1986, most lab bills were paid according to the local prevailing rates which were generally lower than the national limit. However, as the national limit approached 100% of median, the national limitation more often became the constraint.

One additional fee adjustment impacted pricing, specifically for automated and LCL tests. (LCL or "lowest charge level" tests are common tests originally identified in 1979 for special pricing limitations at the carrier 25th percentile levels.) Beginning April 1, 1988 (most of Study Year 3), the 1987 fees for 14 automated tests and 14 LCL tests were further reduced by 8.3%. These tests were :

- Automated Tests
  - Multichannel tests
  - 3 clinical chemistry tests
  - 4 clinical chemistry tests
  - 5 clinical chemistry tests
  - 6 clinical chemistry tests
  - 7 clinical chemistry tests
  - 8 clinical chemistry tests
  - 9 clinical chemistry tests
  - 10 clinical chemistry tests
  - 11 clinical chemistry tests
  - 12 clinical chemistry tests
  - 13-16 clinical chemistry tests
  - 17-18 clinical chemistry tests
  - 19 or more clinical chemistry tests

- LCL Tests
  - Cholesterol serum
  - Complete blood count
  - Blood count
  - Hemoglobin
  - Prothrombin time
  - Sedimentation rate (ESR) Wintrobe
  - Sedimentation rate (ESR) Westergren
  - Glucose except urine
  - Glucose blood, stick test
  - Urinalysis
  - Blood uric acid
  - Blood urea nitrogen
  - White blood cell count.

Fee Freezes and MEI Adjustments

Figure 2 shows the freezes and adjustments in customary and prevailing and actual fees during the study. As can be seen in Figure 2, there was a freeze on customary and prevailing fees for PAR doctors until May 1, 1986. The freeze for non-PAR doctors which was on both the customary and prevailing fees and their actual charges extended until December 31, 1986. In 1987 the prevailing charges became those in effect December 31, 1986 for PAR doctors and were restricted to 96% of the PAR amount for non-PAR doctors. The MEI increase allowed was 3.2%. Maximum Allowable Actual Charge (MAAC) limits were established for non-PAR doctors.

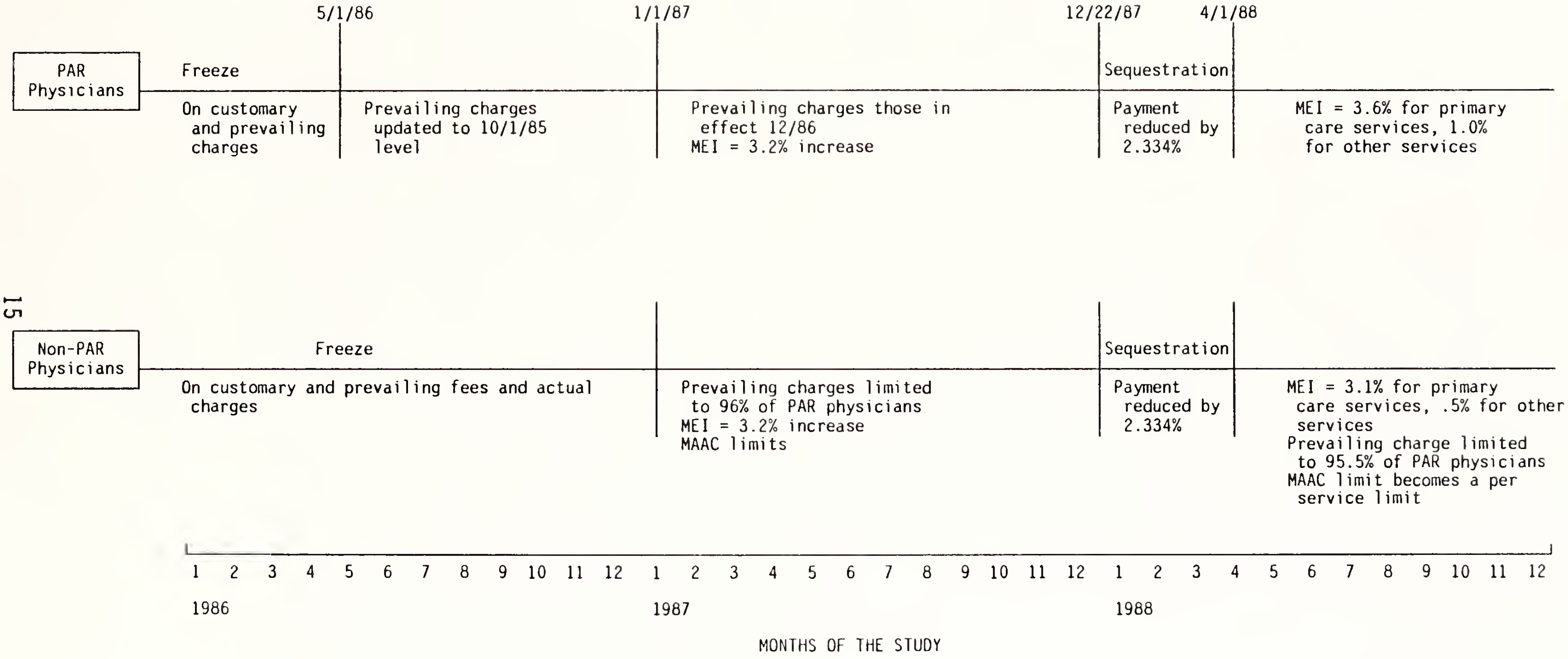
Fees paid to physicians from December 22, 1987 and March 31, 1988, were reduced by 2.334% due to the deficit control activities of 1987. Beginning April 1, 1988, MEI increases allowed were: 3.6% for primary care services of PAR physicians; 1.0% for other services of PAR physicians; 3.1% for primary care services non-PAR physicians, and 0.5% for other services of non-PAR physicians. Non-PAR physicians were limited to 95.5% of PAR physicians and the MAAC limit became a per service rather than average limit.

Limits on Overvalued Surgical Procedures

Beginning January 1, 1987 prevailing charges for cataract surgery were reduced by 10% for 1987 and an additional 2% in 1988 (OBRA86). Effective April 1, 1988, the prevailing charge for ophthalmic ultrasound procedures were restricted to 5% of the prevailing charge for cataract surgery with an intraocular lens implant. In addition effective April 1, 1988 the prevailing charges for twelve procedure were reduced. These procedures were those identified as overvalued in a comparison with relative values determined by early work on the resource-based relative value scale (RBRVS). These procedures (and their procedure codes) were:

Figure 2

PHYSICIAN FREEZES AND ADJUSTMENTS DURING THE STUDY PERIOD


5/1/86
1/1/87
12/22/87
4/1/88
PAR Physicians
Freeze
On customary and prevailing charges
Prevailing charges updated to 10/1/85 level
Prevailing charges those in effect 12/86
MEI = 3.2% increase
Sequestration
Payment reduced by 2.334%
MEI = 3.6% for primary care services, 1.0% for other services
Non-PAR Physicians
Freeze
On customary and prevailing fees and actual charges
Prevailing charges limited to 96% of PAR physicians
MEI = 3.2% increase
MAAC limits
Sequestration
Payment reduced by 2.334%
MEI = 3.1% for primary care services, .5% for other services
Prevailing charge limited to 95.5% of PAR physicians
MAAC limit becomes a per service limit
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
1986
1987
1988
MONTHS OF THE STUDY

- bronchoscopy (31622-31626)
- carpal tunnel repair (64721)
- cataract surgery (66830-66985)
- coronary artery bypass surgery (33510-33528)
- diagnostic and/or therapeutic dilation and curettage (58120)
- knee arthroscopy (29880-29881)
- knee arthroplasty (27466-27447)
- pacemaker implantation surgery (33206-33208)
- total hip replacement (27130-27132)
- suprapubic prostatectomy (55821)
- transurethral resection of the prostate (52601)
- upper gastrointestinal endoscopy (43235-43239).

All prevailing charges were reduced 2% below their FY 1987 level. In addition they are further reduced by the following: 1) 15%, if the 1987 prevailing charge is equal to or greater than 150% of the weighted national average, 2) 0% if the 1987 prevailing charge does not equal 85% of the weighted national average, or 3) a straight-line sliding scale percent reduction of 3/13 of a percentage point for each percent that the 1987 prevailing charge exceeds 85% of the weighted national average.

Relevant Research

A considerable volume of research has been generated on the factors influencing physician utilization and expenditures under the Medicare program. The Evaluation Research Design reviewed the research in detail. In this section we summarize some of the findings from the literature that should be considered in interpreting the data which are presented in Chapter 4. The findings discussed in this section are in three areas: 1) studies of trends in utilization and expenditures: 2) research on factors influencing physician Medicare participation decisions, and 3) research examining physician responses to changes in payment.

Trends in Utilization and Cost

A number of researchers have investigated the overall trends in use and cost using data from the Medicare program.[4] From 1982 to 1987, total allowed charges for physician services have increased 76% from $15 billion to $27 billion. The largest increase was for surgical services where the increase in allowed charges was 85%. Medical care services increased by 52%, consultations by 125%. Diagnostic radiology increased by 133% and therapeutic radiology by 109%. Clinical lab services increased by 84%.[5] These rapid increases in charges have stimulated researchers to investigate the data by examining them by major type of service, place of service, by geographical area, etc. and to try to disaggregate the increase into that due to an increase in the number of eligibles, price, and other factors. Specific service rise has also be investigated. Surgical service use has been explored by Latta and Keene[6] and laboratory data by Dodds and Etheredge.[7]

Physician Participation

One of the principal goals of physician reimbursement reform which was conducted from 1984-1988 was to increase the participation of physicians in the program. To the extent that physicians take assignment of beneficiary claims, beneficiaries' liabilities are restricted to Medicare allowed charges. If physicians do not take assignment, beneficiaries are responsible for total billed charges. The DEFRA legislation of 1984 initiated the Physician Participation and Supplier Program (PAR). This program provided that physicians who agreed to take all their services on assignment (PAR physicians), would have preferences over non-PAR physicians with respect to increases in their fee screens.

There have been several studies of physician assignment which have sought to identify factors important in a physician's decision to accept assignment on a particular claim. These studies indicated that certain provider, claim, carrier, and beneficiary characteristics affected assignment decisions.[8,9,10,11,12,13,14] Some studies used survey data on physicians.[8,11,13] Others used HCFA Medicare data,[9,14] carrier data,[10,12] and one used carrier data combined with data from a survey of beneficiaries.[12] In general, the results were reasonably consistent. Studies found that higher assignment rates were connected with: physicians who were female, not specialists, not board certified,[12] or had a higher percentage of their patients covered by Medicaid; more costly claims;[8,10,12,14] claims processed by carriers with smaller reduction rates;[11] or faster processing speed;[14] and claims for beneficiaries who are poor or who die.[12]

After the PAR program was initiated physician assignment rates increased dramatically.[15] This increased participation has resulted in decreases in beneficiary liability of as much as $1 billion.[16]

Physician Response to Changes in Payment

Most of the legislative changes affecting physician payment in the period 1986-1988 have focused on limiting the price per unit of service (primarily through limiting prevailing charges). Changes have not attempted to directly constrain the volume of services delivered or total expenditures. Without these direct measures of constraining volume, reducing price can only affect expenditures if there are not offsetting increases in the volume or intensity of the services delivered. However, previous research has demonstrated that attempts to control expenditures through price have not been successful.

Data from Holahan and Scanlon's[17] study of California Medicare data during the Nixon Administration's fee freeze showed that despite the freeze, physicians incomes from Medicare continued to increase because of an increased volume of services and an increased intensity of services provided. Rice and McCall[18] found that physicians faced with decreased prevailing charges due to the combination of the 10 fee screen areas in Colorado into one, provided more intense medical services, had lower assignment rates, and charged lower prices. Those whose reimbursement rate increased provided less intensive services, had higher assignment rate, and charged higher prices.

Research by Mitchell, Wedig and Cromwell[19] assessed the impact of the 1984-1986 fee freeze on the screen service volume and intensity. They found that annual Medicare spending per beneficiary rose substantially (29%) from 1983 to 1986, and that physician spending increased disproportionately for three types of services: surgery, radiology, and special diagnostic tests. Spending on specialized tests (e.g., pulmonary function, allergy testing, electroencephalograms, diagnostic cardiac services) increased even more dramatically (67%). Although the rate of increase in spending was the highest for physician initiated services, the authors point out that the prevailing fee freeze (and the actual charge freeze for non-participating physicians) also reduced the out-of-pocket beneficiary cost which may have increased beneficiary demand for services.

Reviews of the Canadian experience also demonstrate a strong relationship between fee levels and service volume.[20] These observed associations argue that both additional service use and alteration of billing patterns are possible when income reductions result.

Also important to consider in analyzing changes in physician use and cost is that there are a number of other factors which can affect the volume, intensity, and assignment of services. Changes in reimbursement of inpatient services, changes in physician payment practices of private insurers, changes in physician payment practices of the Medicaid program, as well as changes in the physician supply and in patient demand can all influence Medicare utilization patterns, and the interpretation of related study findings.

3. DATA SOURCES AND METHODOLOGY

This chapter of the report describes all of the source files that were utilized in the study, the methods used to clean and select data, and some of the key technical investigations and findings that resulted from that effort. Analytical files that resulted from that effort were used to generate six series of analysis tables (Table Series 1-6). Appendix A contains the detailed technical memoranda that were produced throughout the study to document technical problems and findings. These memos have been updated, where applicable, to reflect the most recent information. Below we first discuss the files and fields used. We then describe the beneficiary and provider populations. Finally, other technical investigation findings of importance are discussed.

BMAD Files and Field Descriptions

The Part B Medicare Annual Data (BMAD) files are part of the Medicare data collection system maintained by HCFA. Medicare carriers produce the BMAD files based on data received on claims and contained in their prevailing charge files, beneficiary history files, and physician/supplier history files. The BMAD consists of four files: procedure, prevailing charge, provider, and beneficiary. This study utilized data from all but the prevailing file. The following sections describe how the files and key data fields were used.

Procedure and Linked Procedure/Prevailing Files

The procedure file arrays data on every procedure code used, including its frequency, place and type of service, specialty and submitted and allowed charges. The prevailing file provides the prevailing charges for the procedures in the procedure file. HCFA provided us with linked procedure/prevailing files for 1986 through 1988. When it was determined that no data specific to the prevailing file would be necessary to conduct this study, we utilized the linked files for 1987 and 1988, and the procedure file for 1986 to perform the analysis. (The linked 1986 file was missing non-matching records so the more complete 1986 procedure file was utilized.)

The following data fields from the procedure file were selected for inclusion in the analysis files:

- Procedure code: HCPCS 5-digit code. The two digit modifiers were not utilized in the study. Refer to the Technical Investigations section below for further information on both modifiers and the various levels of HCPCS coding.
- Frequency: number of times the procedure occurred. While duplicates and adjustments are not included in this field, denied procedures are. They were excluded by subtracting the "Denied Frequencies" field.
- Submitted charges: total of all initially submitted charges including submitted charges which were denied. Denied charges were excluded by subtracting the "Amount Denied" field.
- Allowed charges: total of all allowed charges from all accepted line items (including deductibles).
- Denied Frequency: number of times service denied in full. Duplicates or adjustments are not included.
- Amount denied: total submitted charges denied in full.
- Services assigned: number of times service was delivered on assignment.
- Place of Service: defined as office, home, inpatient hospital, SNF, outpatient hospital, independent laboratory, other, independent kidney disease treatment center, ambulatory surgery center, hospice, nursing home. See discussion below.
- MTUS Indicator: differentiates services from items such as ambulance miles, blood units, anesthesia base and time units, etc. See discussion below.
- Specialty: HCFA 2-digit code identifying the type of specialty. See discussion below.

- Carrier: HCFA assigned identification code.
- Relative value: relative value unit, or RVU from the HCFA carrier tape. See discussion below.
- Type of service: defined as medical care, surgery, consultation, diagnostic x-ray, diagnostic laboratory, radiation therapy, anesthesia, assistance at surgery, other medical services, whole blood or packed cells, used DME, ambulatory surgery center (facility use), hospice, purchase of DME (installment vs. lump sum), renal supplies in the home, monthly capitation payments, kidney donor, rental of DME, pneumococcal vaccine, surgical second opinion, surgical third opinion. See discussion below.

Because of known carrier variations in coding, and miscoding by providers, place and type of service, and specialty were carefully reviewed. Modifier coding and the use of local codes were investigated and the results of that analysis are discussed in the Other Technical Investigation Findings section below. Finally, the issue of whether and how to calculate and utilize RVUs was explored. The following discussion explains these investigations.

Although the BMAD files provide very detailed data on place of service (POS), analysis of distribution tables from the procedure file (Supplemental Table 3, "Carrier Distributions") revealed that over 85% of all services occurred in the office or hospital. Other POS codes with any significant volume presented reliability problems. (Refer to Technical Issue Memo #3 in Appendix A for further details.) POS designations were therefore limited to Office, Inpatient, Outpatient and Other.

As for type of service (TOS), it was determined that reliance upon carrier coding of this field was unnecessary because establishing TOS for physician services is more accurately based upon the more reliably coded procedure code field. Procedure codes were therefore categorized into medical procedures, surgical procedures, radiology procedures, and laboratory procedures to define type of service for the purpose of the study.

The accuracy of physician specialty coding was examined. Two factors affect the designation of specialty codes: first, they are physician-selected and subject to change by the physician at any time, and second, individual carriers may choose to use all or a subset of the full range of specialty codes provided by BMAD. These factors adversely affect the potential for utilizing detail level specialty coding for analysis. BMAD specialties were therefore categorized into four generic groupings, namely: General Practice, Medical Specialties, Surgical Specialties, and Other Specialties. Technical Issues Memo #9 in Appendix A describes this process and includes the crosswalk of codes to explain the specialty designations in the study tables.

The issue of RVUs was vital to this study because data about relative value units are necessary in determining the intensity of service. However, investigation of data in the RVU field of the HCFA supplied HCPCS Tape Description File revealed that many procedures were missing RVUs. Technical Issues Memo #2 in Appendix A describes the development of that tape file and our formula for imputing the missing values. Both the procedure file and provider file tables in the study use these RVUs. The procedure file tables include total number of RVUs, RVUs per service billed, and allowed charges per RVU. The provider file tables include RVUs per beneficiary and provider number, total number of RVUs, and allowed charges per RVU. Supplemental Table 2, "RVUs for HCPCS Level I and Selected Level II Codes", shows the RVU values for each procedure code used in this report. It also indicates whether the value existed on the HCPCS file or was calculated according to the formula described in Technical Issue Memo #2.

It is important to note, however, that the RVUs presented in the tables are not adjusted for modifiers. Hundreds of modifiers exist in the data base, many of which are not explained. Some modifiers raise the allowed charges, some lower them and some merely specify a particular circumstance (i.e., left or right side) without changing the allowed charges. While we believe it would have been more desirable to make such adjustments, information was not available to do so. Because of the large numbers and dollars connected with procedures containing modifiers, 34% of the services and 35% of the allowed charges, we believe that this is an area that requires attention in the future.

Because relative values are not scaled consistently across category of service (i.e., a different base is used for surgery RVUs, medical RVUs, radiological RVUs, and laboratory RVUs), the RVU values for total services use the medical RVU base. For fields which require aggregation of services across procedure groups, surgical RVUs, radiology RVUs, and laboratory RVUs were converted to medical RVUs using the total allowed charges and total RVUs for each category of service (medical, surgery, radiology, laboratory).

There is one other data field that requires further discussion. This is the MTUS Indicator Field. This indicator has one of seven values. It is equal to 0 for non-covered services, 1 for transportation miles, 2 for anesthesia time units, 3 for services, 4 for oxygen units, 5 for units of blood, and 6 for anesthesia base and time units. Because the study focused on the growth in physician services, only records where MTUS Indicator indicated Services (MTUS equals 3), were included in the analysis files. The only exception to this are the tables which include anesthesia records in the Surgery-Related Services Table Series 2 (see Attachment 2). This exception is discussed in some detail in the Other Technical Investigations Findings section below.

Provider File

The second BMAD file utilized in the study was the provider file. It includes claims for all services rendered by the selected 5% sample of physician/suppliers. It should be noted that a provider number is a billing number and does not necessarily represent one physician. A physician may have multiple provider numbers or the billing number may represent more than one physician for group practices. The study used the following data fields that share the same definitions as those for the procedure file:

- Procedure code: HCPCS 5-digit code. The two digit modifiers were not utilized in the study. Refer to the Technical Investigations section below for further information on both modifiers and the various levels of HCPCS coding.
- Specialty: HCFA 2-digit code identifying the type of specialty.
- Place of Service: defined as office, home, inpatient hospital, SNF, outpatient hospital, independent laboratory, other, independent kidney disease treatment center, ambulatory surgery center, hospice, nursing home.
- Carrier: HCFA assigned identification code.
- Frequency: number of times the procedure occurred. While duplicates and adjustments are not included in this field, denied procedures are. They were excluded by subtracting the "Denied Frequencies" field.
- Denied Frequency: number of times service denied in full. Duplicates or adjustments are not included.
- Amount denied: total submitted charges denied in full.
- Submitted charges: total of all initially submitted charges including submitted charges which were denied. Denied charges were excluded by subtracting the "Amount Denied" field.
- Allowed charges: total of all allowed charges from all accepted line items (including deductibles).
- MTUS Indicator: differentiates services from items such as ambulance miles, blood units, anesthesia base and time units, etc.

New data fields from the provider file include the following:

- Provider ID Number: The identification number used by the carrier that identifies the physician, group, clinic, supplier or other entity that provided the service, which the carrier uses for developing customary charges.
- Beneficiary Claim Number: The Health Insurance Code (HIC) number recorded in the carrier's claims history for that line item.
- Assignment Indicator: Code which defines if the claims was provided by a participating provider, and whether or not it was assigned. For purposes of this study, the indicators were recoded into assigned or non-assigned.
- Processing Indicator: Detailed coding to show whether the line item was allowed, denied, an adjustment, or one in which Medicare was the secondary payor.

Provider file distributions for type of provider, physician/supplier number indicator, number of physicians/suppliers, and specialty are shown in Attachment 1, Supplemental Table 5, "Provider File Distributions". Coding for the first three of these variables is believed to be highly unreliable. There is no reliable way to establish the number of physicians represented by any given provider number or the number of physicians having more than a single provider number. Therefore, Provider Table Series 6 (Attachment 2) presents data per provider number (not per provider) and per beneficiary. The table also provides the number of beneficiaries receiving services per provider number.

Specialty designations presented further problems in that provider numbers appear on the file with multiple specialties. In the interests of retaining unduplicated counts of provider numbers, each provider number was assigned the specialty which accounted for the highest amount of allowed charges for that provider. The specialty groupings were also expanded from the four groups identified in the procedure file tables, to eight groups. (See Memo #15 in Appendix A for more details.) Finally, Technical Issues Memo #16 describes which line items (in addition to those for which MTUS Indicator was not Services) were excluded from the BMAD provider file for the study analysis. Note that states serviced by Massachusetts Blue Shield (Maine, Vermont, New Hampshire and Massachusetts) are not included in any of the provider file national totals because of incomplete data.

The Beneficiary Population

The study utilized two HCFA source files for the calculation of the person-years of eligibility and person-years of use. This section describes those files and the data calculated from them to make estimates of the number of person-years of beneficiaries with HMO enrollment, the amount of beneficiary out-of-carrier area processing activity and the number of person-years of Medicare eligibility by carrier who are eligible for Medicaid.

Sources of Data: The Eligibility File and BMAD Beneficiary File

HCFA provided a specially constructed file of eligibility data for our use in this study. The file was derived from the HI Master Eligibility File. It contained the following data elements that were utilized for establishing months of eligibility and other characteristics:

- County & Zip Codes: Used for establishing "carrier of residence".
- Entitlement/Summary: Used for determining the total number of months the beneficiary was entitled to Medicare.
- Buy-In Summary: Used for determining the total number of months the beneficiary was bought into Medicaid eligibility.
- HMO Summary: Used for determining the total number of months the beneficiary was a member of an HMO.

We also received a HCFA-created summary BMAD Beneficiary file based on the five percent sample BMAD beneficiary history file. The summary file contained records for each combination of HIC number and carrier, for each year of the study. This file was utilized as the source of "user" information, for establishing the numbers of person-years of use per carrier. Technical Issues Memos #1 and #4 describe these calculations, and the methodologies utilized for resolving matching problems between the files. It is important to note that all numbers reported are for person-years of eligibility. The numbers of eligibles and users (values that appear in Supplemental Table 1, "Denominators" and are used to construct the per eligible and per user figures in all the Table Series), are person-year numbers, i.e. they are the number of person-years of Part B Entitlement for eligibles and users.

Data on Eligibles and Users

Number of Eligibles, Users, Medicaid Eligibles by Carrier

Table 1 shows the number of person-years of eligibility, percentage of person-years of eligibility with use, and the percentage of eligibility with Medicaid coverage per carrier. The national average percent of eligibles with use increased from 78% to 80% during the study period. While most carrier figures fall within a limited range of variation, certain exceptions are notable. Several carriers have percentages of use over 90% (specifically District of Columbia, Delaware, and North Carolina). It is important to note that the District of Columbia carrier territory includes two counties in

Table 1

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
All Carriers	30,445,351	77.9	9.6	31,030,721	78.9	9.6	31,486,709	80.2	9.7
Alabama 00510 BC & BS of Alabama	514,277	78.2	19.4	523,307	80.1	17.2	531,404	81.3	16.6
Alaska 01020 Aetna Life & Casualty	17,281	62.1	17.9	18,577	65.6	19.1	19,948	64.9	19.5
Arkansas 00520 Arkansas BS	350,385	78.4	18.1	354,528	80.2	17.8	358,044	81.0	17.4
Arizona 01030 Aetna Life & Casualty	399,843	77.7	4.7	417,654	79.1	4.6	433,398	80.2	4.7
California 00542 California Physicians Service (d/b/a BS of California)	1,474,102	77.9	19.6	1,517,939	72.1	19.7	1,556,222	71.6	19.7
California 02050 TransAmerica Occidental Life	1,393,865	78.5	19.6	1,421,666	76.5	19.6	1,435,994	75.5	19.7
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	291,333	78.3	11.4	301,241	75.6	11.4	310,414	73.6	11.3
Connecticut 10230 Travelers Insurance Company	425,854	79.0	3.5	431,313	80.5	3.7	434,673	81.2	3.9
District of Columbia 00580 Pennsylvania BS	243,522	94.3	9.3	250,274	90.9	9.5	254,614	96.0	9.7

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
Delaware 00570 Pennsylvania BS	74,303	93.0	5.4	76,498	123.6	5.2	78,568	157.9	5.2
Florida 00590 BS of Florida	1,983,233	79.3	7.1	2,046,896	82.8	7.2	2,107,004	83.2	7.5
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	632,102	78.8	18.8	647,048	80.5	18.5	659,699	82.2	18.2
Hawaii 01120 Aetna Life & Casualty	101,915	77.7	9.4	106,700	63.6	9.2	110,957	63.4	9.2
Iowa 00640 BS of Iowa	418,744	79.1	7.5	423,145	79.6	8.2	426,029	81.0	8.5
Idaho 05130 Equicor, Inc. -- Equitable Corporation	111,061	77.3	6.2	113,967	78.3	6.2	116,354	78.3	6.4
Illinois 00621 BS of Illinois	1,365,258	69.2	3.3	1,384,522	70.8	3.5	1,395,987	72.8	3.5
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	671,066	74.8	6.7	683,978	77.0	7.0	693,476	80.4	7.2
Kansas 00650 BS of Kansas	274,012	77.0	7.3	276,838	76.2	7.3	278,523	79.4	7.3

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
Kansas & Missouri 00740 BS of Kansas City	229,211	82.6	5.3	232,857	83.2	5.2	235,156	80.3	5.2
Kentucky 00660 BC & BS of Kentucky	469,623	73.6	12.6	477,919	77.4	12.6	484,256	81.4	12.4
Louisiana 00528 Arakansas BC & BS	460,925	72.6	16.5	471,862	76.0	16.1	480,225	78.9	15.7
Massachusetts 00700 BS of Massachusetts	790,920	81.2	9.5	795,842	80.8	9.2	797,795	82.3	9.1
Maryland 00690 BS of Maryland	354,629	76.9	9.8	362,316	82.2	9.9	368,309	76.8	9.9
Maine 21200 BS of Massachusetts	164,092	79.0	9.2	166,716	81.7	9.1	168,546	82.3	9.0
Michigan 00710 BC & BS of Michigan	1,104,919	82.3	6.1	1,124,169	83.7	6.1	1,140,240	88.3	6.1
Minnesota 00720 BC & BS of Minnesota	289,409	58.6	3.5	292,585	55.1	3.5	294,682	61.8	3.7
Minnesota 10240 The Travelers Insurance Company	231,856	73.4	2.8	236,312	69.3	2.9	240,048	70.9	3.1
Missouri 11260 General American Life	514,388	81.3	7.0	520,814	82.2	6.8	525,500	84.3	6.6

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
Mississippi 10250 The Travelers Insurance Company	330,574	72.1	26.0	335,295	73.3	25.6	338,925	76.2	24.7
Montana 00751 BS of Montana	98,120	74.1	8.0	100,525	75.5	8.1	102,636	76.6	8.4
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	764,001	91.1	8.6	786,220	96.9	9.0	805,682	99.0	9.4
N. Dakota & S. Dakota 00820 BS of North Dakota	188,461	88.6	4.7	191,331	91.3	4.7	192,985	93.3	4.9
Nebraska 00645/00655 BC of Iowa BS of Kansas	212,439	71.6	3.5	214,481	73.4	3.4	215,489	80.3	3.5
New Hampshire & Vermont 00780 BC & BS of Massachusetts	188,088	78.4	4.9	190,881	79.7	4.8	193,427	80.7	4.8
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	997,259	83.7	7.6	1,010,146	83.7	7.8	1,016,454	79.0	8.2
New Mexico 01360 Aetna Life & Casualty Company	143,862	68.6	12.7	149,172	66.6	12.9	153,984	70.5	13.1
Nevada 01290 Aetna Life & Casualty Company	99,164	70.5	6.1	105,614	70.9	5.8	112,204	73.4	5.7

Table 1 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
New York 00801 BS of Western New York	793,319	77.0	6.1	803,284	78.4	6.2	810,154	78.1	6.3
New York 00803 Empire BC & BS	1,261,369	84.2	10.0	1,264,278	84.8	10.3	1,259,117	85.1	10.4
New York 14330 Group Health Incorporated	267,351	53.7	8.9	267,189	53.9	9.3	265,252	53.4	9.6
Ohio 16360 Nationwide Mutual Insurance Company	1,352,295	77.2	6.3	1,378,507	80.2	6.3	1,400,228	83.8	6.5
Oklahoma 01370 Aetna Life & Casualty Company	405,083	69.9	10.2	411,074	73.6	10.1	415,631	76.1	10.0
Oregon 01380 Aetna Life & Casualty Company	360,502	75.9	6.0	369,766	74.1	6.1	378,265	73.9	6.2
Pennsylvania 00865 Pennsylvania BS	1,733,154	80.1	5.1	1,758,347	79.9	5.1	1,775,333	81.4	5.1
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	251,391	72.0	0.7	258,987	72.6	0.8	264,575	76.0	0.8
Rhode Island 00870 BS of Rhode Island	145,204	83.2	6.8	146,509	83.1	6.8	146,990	84.2	6.7
Railroad 10071 The Travelers Insurance Company	830,684	76.5	2.3	825,529	78.5	2.4	815,690	78.9	2.4

Table 1 (Concluded)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH USE, AND PERCENTAGE OF PERSON-YEARS OF ELIGIBILITY WITH MEDICAID COVERAGE, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***	Person-Years Of Eligibility*	% With Use**	% With Medicaid***
South Carolina 00880 BC & BS of South Carolina	373,068	68.1	17.6	385,543	71.1	17.2	396,744	76.1	16.8
Tennessee 05440 Equicor, Inc.--Equitable Corporation	607,964	79.9	13.4	619,532	81.9	13.1	629,301	84.7	12.9
Texas 00900 Group Medical/Surgical Services	1,552,526	78.2	14.2	1,595,190	80.9	14.1	1,633,482	82.6	13.9
Utah 00910 BS of Utah	126,350	81.1	5.8	130,568	83.4	5.8	134,863	83.7	5.8
Virginia 10490 The Travelers Insurance Company	534,638	72.4	11.0	548,330	73.5	10.9	560,219	75.0	10.8
Washington 00930 Washington Physician Service	518,391	78.0	8.3	534,192	79.1	8.4	548,234	79.4	8.6
Wisconsin 00951 Wisconsin Physicians' Service Corporation	645,542	80.7	6.9	655,570	82.1	7.0	663,427	83.0	7.1
West Virginia 16510 Nationwide Mutual Insurance Company	271,834	67.9	8.1	275,288	69.9	8.1	278,355	72.2	8.1
Wyoming 05530 Equicor, Inc.--Equitable Corporation	40,590	59.1	0.3	41,890	60.5	0.3	43,000	62.1	0.4

BC = Blue Cross, BS = Blue Shield

* Unadjusted person years of eligibility

** Unadjusted person years of use divided by unadjusted person years of eligibility

Maryland and Virginia and the town of Alexandria. Other carriers have percentages of use less than 66% (Alaska, Minnesota BC/BS, New York Group Health and Wyoming). The seemingly impossible greater than 100% use rates in Delaware are likely related to the Delaware carrier taking over the processing of laboratory claims for a large chain of private laboratories located in multiple states. The next section discusses possible reasons for the District of Columbia, Minnesota and New York statistics. Alaska and Wyoming percentages may simply reflect a high percentage of eligibles leaving their state during winter months, and a limited availability of providers.

Table 1 also shows the impact on the population of dual entitlement, i.e., the extent of Medicaid crossover beneficiaries by carrier (also called buy-ins because the state pays their Medicare Part B premium). Approximately ten percent of all beneficiaries have Medicaid coverage. Only nine carriers show less than five percent of eligibles eligible for Medicaid, but the figures vary from state to state. What is interesting in the table is the relatively high level of buy-ins reported for Louisiana and Alaska, 17% and 18% respectively in 1986. This is surprising because these two states did not have a buy-in program in 1985. For 1988, the range was 0.3% in Wyoming to 19.7% for California Blue Shield. These differences are a measure of the differing eligibility requirements of the various state programs. Knowledge of the level of crossover activity is important in evaluating assignment rates because all crossover claims are by definition assigned.

Adjustments for HMO Enrollment and Border Crossing by Carrier

Beneficiaries who are enrolled in HMOs generally receive most of their services through the HMO. No claims will appear on the BMAD file for them for services received from the HMO. Although it is true that beneficiaries enrolled in Group Practice Prepayment Plan (GPPP) HMOs can go outside the HMO for service and many do[21], we decided to remove them from the eligibility numbers. Our other options were to leave them in or to take out a proportion of them. Consequently, the eligibility numbers are slightly understated.

Border crossers are those beneficiaries who have services processed through carriers outside the carrier area in which they reside. Border crossing beneficiaries may be literally crossing their state borders (e.g. snowbirds wintering in the sunbelt) or simply crossing their carrier borders (where a given state is serviced by multiple carriers, such as New York and California), or seeking medical care at specialty facilities in other states, such as those going to Minnesota's Mayo Clinic. The eligibility numbers per carrier were adjusted to reflect this activity. The attachment to Technical Issues Memo #1 describes in detail the methodology utilized to calculate the adjustments to the numbers of person-years of eligibility and use. Attachment 2's Supplemental Table 1, "Denominators", displays both unadjusted and adjusted person-years of eligibility and use by carriers and for the nation. (Technical Issues Memo #12 describes these table entries in more detail.)

Table 2 presents the number of person-years of eligibility, the number of person-years of eligibility after adjusting for HMO enrollment and border crossing, and the size or percentage of that adjustment. The adjustment shown for all carriers is for HMO adjustments only because there would be no border crossing adjustment for all carriers. The range of adjustments vary dramatically. In 1988, it impacted the number of person-years of eligibility in the range from minus 49.2% to plus 28.2% by carrier. Some of the 1988 outliers of interest are: the District of Columbia with plus 12% indicating beneficiaries from neighboring areas are utilizing District providers; Delaware with plus 28%, reflecting the carrier's status as a national processor for a large laboratory chain; Hawaii at minus 32%, primarily associated with HMO enrollment; Minnesota BC's minus 49% showing both a high HMO adjustment and a tendency of Minnesota beneficiaries to use providers in other carrier areas (Mayo Clinic); Minnesota Travelers' plus 24%, reflecting out-of-area users of the Mayo Clinic but also adjusted by high HMO enrollment; and New York GHI's minus 43%, indicating that Queens' beneficiaries may be utilizing the other New York City providers. It should be remembered in examining these data that the adjustment is for two factors: HMO enrollment and border crossing activity, so that a state like Oregon can have a relatively large adjustment (14% in 1986, 19% in 1987, 22% in 1988) where the

Table 2

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY, AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
All Carriers	30,445,351	28,968,325	-4.9	31,030,721	29,304,452	-5.6	31,486,709	29,730,774	-5.6
Alabama 00510 BC & BS of Alabama	514,277	495,444	-3.7	523,307	504,639	-3.6	531,404	511,801	-3.7
Alaska 01020 Aetna Life & Casualty	17,281	13,943	-19.3	18,577	15,084	-18.8	19,948	16,572	-16.9
Arkansas 00520 Arkansas BS	350,385	328,305	-6.3	354,528	331,694	-6.4	358,044	333,710	-6.8
Arizona 01030 Aetna Life & Casualty	399,843	387,064	-3.2	417,654	395,241	-5.4	433,398	417,313	-3.7
California 00542 California Physicians Service (d/b/a BS of California)	1,474,102	1,239,472	-15.9	1,517,939	1,258,272	-17.1	1,556,222	1,263,284	-18.8
California 02050 TransAmerica Occidental Life	1,393,865	1,369,228	-1.8	1,421,666	1,362,027	-4.2	1,435,994	1,362,486	-5.1
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	291,333	278,774	-4.3	301,241	275,579	-8.5	310,414	269,983	-13.0
Connecticut 10230 Travelers Insurance Company	425,854	410,396	-3.6	431,313	410,994	-4.7	434,673	415,740	-4.4
District of Columbia 00580 Pennsylvania BS	243,522	283,304	16.3	250,274	293,445	17.3	254,614	285,131	12.0

Table 2 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY,
AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
Delaware 00570 Pennsylvania BS	74,303	74,921	0.8	76,498	76,578	0.1	78,568	100,691	28.2
Florida 00590 BS of Florida	1,983,233	1,833,372	-7.6	2,046,896	1,880,299	-8.1	2,107,004	2,029,582	-3.7
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	632,102	643,100	1.7	647,048	655,233	1.3	659,699	665,993	1.0
Hawaii 01120 Aetna Life & Casualty	101,915	81,501	-20.0	106,700	73,316	-31.3	110,957	75,813	-31.7
Iowa 00640 BS of Iowa	418,744	364,739	-12.9	423,145	366,807	-13.3	426,029	367,268	-13.8
Idaho 05130 Equicor, Inc. -- Equitable Corporation	111,061	91,915	-17.2	113,967	94,015	-17.5	116,354	94,647	-18.7
Illinois 00621 BS of Illinois	1,365,258	1,245,068	-8.8	1,384,522	1,261,040	-8.9	1,395,987	1,271,527	-8.9
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	671,066	628,292	-6.4	683,978	631,083	-7.7	693,476	639,461	-7.8
Kansas 00650 BS of Kansas	274,012	228,301	-16.7	276,838	229,270	-17.2	278,523	238,338	-14.4

Table 2 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY, AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
Kansas & Missouri 00740 BS of Kansas City	229,211	239,008	4.3	232,857	241,979	3.9	235,156	237,795	1.1
Kentucky 00660 BC & BS of Kentucky	469,623	437,688	-6.8	477,919	444,661	-7.0	484,256	461,197	-4.8
Louisiana 00528 Arakansas BC & BS	460,925	454,537	-1.4	471,862	465,367	-1.4	480,225	471,841	-1.8
Massachusetts 00700 BS of Massachusetts	790,920	777,603	-1.7	795,842	774,752	-2.7	797,795	767,908	-3.8
Maryland 00690 BS of Maryland	354,629	342,695	-3.4	362,316	347,920	-4.0	368,309	355,378	-3.5
Maine 21200 BS of Massachusetts	164,092	152,409	-7.1	166,716	155,505	-6.7	168,546	157,464	-6.6
Michigan 00710 BC & BS of Michigan	1,104,919	1,041,616	-5.7	1,124,169	1,050,535	-6.6	1,140,240	1,080,901	-5.2
Minnesota 00720 BC & BS of Minnesota	289,409	138,292	-52.2	292,585	133,333	-54.4	294,682	149,851	-49.2
Minnesota 10240 The Travelers Insurance Company	231,856	320,438	38.2	236,312	312,313	32.2	240,048	297,123	23.8
Missouri 11260 General American Life	514,388	515,996	0.3	520,814	521,577	0.2	525,500	514,851	-2.0

Table 2 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY, AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
Mississippi 10250 The Travelers Insurance Company	330,574	287,540	-13.0	335,295	291,422	-13.1	338,925	299,746	-11.6
Montana 00751 BS of Montana	98,120	92,593	-5.6	100,525	94,537	-6.0	102,636	94,413	-8.0
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	764,001	797,662	4.4	786,220	817,395	4.0	805,682	837,078	3.9
N. Dakota & S. Dakota 00820 BS of North Dakota	188,461	200,353	6.3	191,331	201,720	5.4	192,985	211,703	9.7
Nebraska 00645/00655 BC of Iowa BS of Kansas	212,439	191,924	-9.7	214,481	191,952	-10.5	215,489	201,616	-6.4
New Hampshire & Vermont 00780 BC & BS of Massachusetts	188,088	167,397	-11.0	190,881	166,130	-13.0	193,427	169,044	-12.6
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	997,259	997,420	0.0	1,010,146	1,013,066	0.3	1,016,454	958,808	-5.7
New Mexico 01360 Aetna Life & Casualty Company	143,862	123,558	-14.1	149,172	124,484	-16.6	153,984	128,193	-16.8
Nevada 01290 Aetna Life & Casualty Company	99,164	98,415	-0.8	105,614	100,825	-4.5	112,204	111,069	-1.0

Table 2 (Continued)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY, AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
New York 00801 BS of Western New York	793,319	741,877	-6.5	803,284	739,736	-7.9	810,154	731,888	-9.7
New York 00803 Empire BC & BS	1,261,369	1,316,917	4.4	1,264,278	1,344,687	6.4	1,259,117	1,294,016	2.8
New York 14330 Group Health Incorporated	267,351	148,902	-44.3	267,189	152,861	-42.8	265,252	151,721	-42.8
Ohio 16360 Nationwide Mutual Insurance Company	1,352,295	1,306,706	-3.4	1,378,507	1,326,851	-3.8	1,400,228	1,405,184	0.4
Oklahoma 01370 Aetna Life & Casualty Company	405,083	365,734	-9.7	411,074	369,785	-10.0	415,631	370,286	-10.9
Oregon 01380 Aetna Life & Casualty Company	360,502	309,380	-14.2	369,766	301,226	-18.5	378,265	296,914	-21.5
Pennsylvania 00865 Pennsylvania BS	1,733,154	1,731,678	-0.1	1,758,347	1,758,599	0.0	1,775,333	1,745,367	-1.7
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	251,391	235,324	-6.4	258,987	241,400	-6.8	264,575	247,763	-6.4
Rhode Island 00870 BS of Rhode Island	145,204	136,630	-5.9	146,509	138,486	-5.5	146,990	134,868	-8.3
Railroad 10071 The Travelers Insurance Company	830,684	789,216	-5.0	825,529	779,675	-5.6	815,690	770,014	-5.6

Table 2 (Concluded)

NUMBER OF PERSON-YEARS OF ELIGIBILITY, NUMBER OF ADJUSTED PERSON-YEARS OF ELIGIBLITY, AND IMPACT OF THE ADJUSTMENT, BY CARRIER, 1986 - 1988

	1986			1987			1988		
	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment	Person-Years of Eligibility	Person-Years of Eligibility Adjusted	% of the Adjustment
South Carolina 00880 BC & BS of South Carolina	373,068	319,688	-14.3	385,543	325,497	-15.6	396,744	358,930	-9.5
Tennessee 05440 Equicor, Inc.--Equitable Corporation	607,964	652,313	7.3	619,532	656,491	6.0	629,301	675,305	7.3
Texas 00900 Group Medical/Surgical Services	1,552,526	1,590,291	2.4	1,595,190	1,625,606	1.9	1,633,482	1,653,670	1.2
Utah 00910 BS of Utah	126,350	126,363	0.0	130,568	129,354	-0.9	134,863	133,942	-0.7
Virginia 10490 The Travelers Insurance Company	534,638	494,827	-7.5	548,330	504,618	-8.0	560,219	510,274	-8.9
Washington 00930 Washington Physician Service	518,391	475,752	-8.2	534,192	486,051	-9.0	548,234	502,234	-8.4
Wisconsin 00951 Wisconsin Physicians' Service Corporation	645,542	603,643	-6.5	655,570	608,101	-7.2	663,427	622,376	-6.2
West Virginia 16510 Nationwide Mutual Insurance Company	271,834	223,369	-17.8	275,288	225,578	-18.1	278,355	233,646	-16.1
Wyoming 05530 Equicor, Inc.--Equitable Corporation	40,590	25,431	-37.4	41,890	25,760	-38.5	43,000	27,057	-37.1

BC = Blue Cross
BS = Blue Shield

adjustment is due mainly to HMO enrollment rather than border crossing activity. Wyoming is an example of a large adjustment (37% in 1986, 39% in 1987, and 37% in 1988), almost all of which is due to border crossing activity.

Percentage Distribution of Eligibles and Allowed Charges by Carrier

Table 3 shows the carriers by their distribution of eligibles and allowed charges. Comparing the percentage eligibles with the percentage allowed charges shows some variances for some carrier areas. For instance, in carriers in Iowa, Indiana, Kentucky, North Carolina, Tennessee, Wisconsin, Western New York, and Minnesota Travellers, the percentage of allowed charges is smaller then the percentage of eligibles. This may reflect lower utilization, intensity, and/or charge levels. In the case of Travellers, it should be noted that BMAD reporting of Mayo Clinic charges was truncated, resulting in a substantial understating of total charges for Minnesota Travellers for all three study years. In contrast, California, Florida, and Empire New York show considerably larger percentages of charges than percentages of eligibles. Even within California, there is substantial variation in the relationship between the two carriers. This may be due, in part, to the largely rural vs. urban characteristics of the counties assigned to the northern (Blue Shield) vs. southern California (TransAmerica Occidental) carriers. The majority of carriers, however, fall within a range of less than 0.5% variation. What is especially interesting to note is the ten carriers that make up almost a majority (47%) of the beneficiaries and more than a majority (55%) of the allowed charges. These carriers are: California Blue Shield, California Occidental, Texas, Florida, Illinois, Michigan, Ohio, New Jersey, New York Empire, Pennsylvania. In some of the tables which follow data from these ten carriers are presented to give the reader an idea of the carrier variation using the ten most important carriers driving the totals.

Table 3

PERCENTAGE DISTRIBUTION OF PERSON–YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person–Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
All Carriers	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Alabama 00510 BC & BS of Alabama	1.7	1.7	1.7	1.7	1.5	1.6	1.6	1.6
Alaska 01020 Aetna Life & Casualty	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Arkansas 00520 Arkansas BS	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0
Arizona 01030 Aetna Life & Casualty	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.5
California 00542 California Physicians Service (d/b/a BS of California)	4.3	4.3	4.2	4.3	5.5	5.2	5.0	5.1
California 02050 TransAmerica Occidental Life	4.7	4.6	4.6	4.7	7.9	7.4	7.2	7.3
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	1.0	0.9	0.9	0.9	0.7	0.7	0.7	0.7

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON–YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person–Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
Connecticut 10230								
Travelers Insurance Company	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
District of Columbia 00580								
Pennsylvania BS	1.0	1.0	1.0	1.0	1.3	1.3	1.2	1.2
Delaware 00570								
Pennsylvania BS	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Florida 00590								
BS of Florida	6.3	6.4	6.8	6.5	7.5	8.7	9.4	9.0
Georgia 13110/01040								
The Prudential Insurance Co. of America								
Aetna Life & Casualty	2.2	2.2	2.2	2.2	1.9	2.0	2.0	2.0
Hawaii 01120								
Aetna Life & Casualty	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Iowa 00640								
BS of Iowa	1.3	1.3	1.2	1.2	0.9	0.8	0.9	0.9
Idaho 05130								
Equicor, Inc. -- Equitable Corporation	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON-YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person-Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
Illinois 00621 BS of Illinois	4.3	4.3	4.3	4.3	4.0	3.9	4.0	3.9
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	2.2	2.2	2.2	2.2	1.8	1.8	1.7	1.8
Kansas 00650 BS of Kansas	0.8	0.8	0.8	0.8	0.6	0.6	0.6	0.6
Kansas & Missouri 00740 BS of Kansas City	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8
Kentucky 00660 BC & BS of Kentucky	1.5	1.5	1.6	1.5	1.2	1.2	1.3	1.2
Louisiana 00528 Arakansas BC & BS	1.6	1.6	1.6	1.6	1.5	1.6	1.7	1.6
Massachusetts 00700 BS of Massachusetts	2.7	2.6	2.6	2.6	2.7	2.6	2.6	2.6
Maryland 00690 BS of Maryland	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.3

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON-YEARS OF ELIGIBILITY
AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person-Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
Maine 21200 BS of Massachusetts	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Michigan 00710 BC & BS of Michigan	3.6	3.6	3.6	3.6	4.0	3.8	3.8	3.8
Minnesota 00720 BC & BS of Minnesota	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3
Minnesota 10240 The Travelers Insurance Company	1.1	1.1	1.0	1.1	0.5	0.4	0.5	0.4
Missouri 11260 General American Life	1.8	1.8	1.7	1.8	1.5	1.5	1.5	1.5
Mississippi 10250 The Travelers Insurance Company	1.0	1.0	1.0	1.0	0.8	0.8	0.8	0.8
Montana 00751 BS of Montana	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	2.8	2.8	2.8	2.8	2.1	2.2	2.1	2.2

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON-YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person-Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
N. Dakota & S. Dakota 00820 BS of North Dakota	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.5
Nebraska 00645/00655 BC of Iowa BS of Kansas	0.7	0.7	0.7	0.7	0.5	0.5	0.4	0.4
New Hampshire & Vermont 00780 BC & BS of Massachusetts	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	3.4	3.5	3.2	3.4	3.7	3.5	3.3	3.4
New Mexico 01360 Aetna Life & Casualty Company	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Nevada 01290 Aetna Life & Casualty Company	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4
New York 00801 BS of Western New York	2.6	2.5	2.5	2.5	2.1	2.0	2.1	2.0

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON-YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person-Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
New York 00803 Empire BC & BS	4.5	4.6	4.4	4.5	6.3	6.0	5.9	5.9
New York 14330 Group Health Incorporated	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.6
Ohio 16360 Nationwide Mutual Insurance Company	4.5	4.5	4.7	4.6	4.1	4.3	4.4	4.4
Oklahoma 01370 Aetna Life & Casualty Company	1.3	1.3	1.2	1.3	1.0	1.0	1.1	1.1
Oregon 01380 Aetna Life & Casualty Company	1.1	1.0	1.0	1.0	0.9	0.8	0.8	0.8
Pennsylvania 00865 Pennsylvania BS	6.0	6.0	5.9	5.9	6.5	6.6	5.4	6.0
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	0.8	0.8	0.8	0.8	0.5	0.6	0.6	0.6
Rhode Island 00870 BS of Rhode Island	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4

Table 3 (Continued)

PERCENTAGE DISTRIBUTION OF PERSON–YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 – 1988

	% of Person–Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
Railroad 10071 The Travelers Insurance Company	2.7	2.7	2.6	2.7	2.5	2.4	2.4	2.4
South Carolina 00880 BC & BS of South Carolina	1.1	1.1	1.2	1.1	0.7	0.7	0.8	0.8
Tennessee 05440 Equicor, Inc.––Equitable Corporation	2.3	2.2	2.3	2.3	1.8	1.8	1.8	1.8
Texas 00900 Group Medical/Surgical Services	5.5	5.5	5.6	5.5	5.5	5.8	6.0	5.9
Utah 00910 BS of Utah	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.3
Virginia 10490 The Travelers Insurance Company	1.7	1.7	1.7	1.7	1.4	1.4	1.4	1.4
Washington 00930 Washington Physician Service	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6
Wisconsin 00951 Wisconsin Physicians' Service Corporation	2.1	2.1	2.1	2.1	1.6	1.6	1.6	1.6

Table 3 (Concluded)

PERCENTAGE DISTRIBUTION OF PERSON-YEARS OF ELIGIBILITY AND ALLOWED CHARGES, BY CARRIER, 1986 - 1988

	% of Person-Years of Eligibility*				% of Allowed Charges			
	1986	1987	1988	Total	1986	1987	1988	Total
West Virginia 16510 Nationwide Mutual Insurance Company	0.8	0.8	0.8	0.8	0.6	0.7	0.7	0.7
Wyoming 05530 Equicor, Inc.--Equitable Corporation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

* Adjusted years of eligibility

The Provider Population in the Provider Files

This section will present data from the provider files on the number of provider numbers and the beneficiary to provider number ratios. The provider file contains claim data for a 5% sample of physicians/suppliers numbers. It is provided by the carriers to HCFA as part of the BMAD system. Once a provider number is selected for the sample, that number should remain in the sample until the provider discontinues participation in the program. The data do not necessarily reflect adherence to this procedure. Although HCFA specifies that the sample is to be random, there are no mandatory directions given as to exactly how the sample is to be selected.

Data from the provider files are only included in our table series if they are for services (MTUS indicator must equal 3), and are allowable HCFA Level I codes, or HCFA Level II or Level III codes translated to allowable CPT codes, and have a processing indicator equal to allowed. Claims with all other processing indicators were deleted because allowed amounts would not have been comparable. (Refer to Technical Issues Memo #16.) Note that this restriction to eliminate claims where Medicare was a secondary payer resulted in losing the majority of data in 1988 for three carriers serviced by Massachusetts Blue Shield in our final analytical files. Thus these three carriers for all three years are excluded from the "All Carrier Totals" presented in this Chapter and in Chapter 4. Note also that the restrictions described in the first sentence should have resulted in the exclusion of suppliers from the table series. This is mainly due to our elimination of Level II codes that are related to services provided by suppliers (see Technical Issues Memo #5).

Table 4 shows the number of provider numbers contained in our analytical file by carrier and year. The numbers in 1986 range from 31 in Wyoming to 2334 in New York (Empire). The Travelers Insurance carrier which processes claims for Railroad beneficiaries has 12,530 provider numbers. This is understandable because they process data for Railroad beneficiaries all across the country.

Table 4

NUMBER OF PROVIDER NUMBERS,
BY CARRIER, 1986 - 1988

	1986	1987	1988	% Change
All Carriers	35,050 *	34,442 *	35,501 *	1.3
Alabama 00510 BC & BS of Alabama	422	369	364	-13.7
Alaska 01020 Aetna Life & Casualty	39	40	45	15.4
Arkansas 00520 Arkansas BS	275	270	260	-5.5
Arizona 01030 Aetna Life & Casualty	311	328	329	5.8
California 00542 California Physicians Service (d/b/a BS of California)	1,046	1,099	1,087	3.9
California 02050 TransAmerica Occidental Life	1,343	1,364	1,376	2.5
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	338	275	266	-21.3
Connecticut 10230 Travelers Insurance Company	342	286	282	-17.5
District of Columbia 00580 Pennsylvania BS	269	231	369	37.2
Delaware 00570 Pennsylvania BS	38	37	56	47.4
Florida 00590 BS of Florida	1,243	1,255	1,548	24.5

Table 4 (Continued)

NUMBER OF PROVIDER NUMBERS, BY CARRIER, 1986 - 1988

	1986	1987	1988	% Change
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	464	483	755	62.7
Hawaii 01120 Aetna Life & Casualty	129	138	147	14.0
Iowa 00640 BS of Iowa	223	186	171	-23.3
Idaho 05130 Equicor, Inc. -- Equitable Corporation	72	61	51	-29.2
Illinois 00621 BS of Illinois	909	863	942	3.6
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	421	420	368	-12.6
Kansas 00650 BS of Kansas	129	118	112	-13.2
Kansas & Missouri 00740 BS of Kansas City	279	143	171	-38.7
Kentucky 00660 BC & BS of Kentucky	403	295	242	-40.0
Louisiana 00528 Arakansas BC & BS	613	614	581	-5.2
Massachusetts 00700 BS of Massachusetts	569	549	2	-99.6
Maryland 00690 BS of Maryland	295	296	268	-9.2
Maine 21200 BS of Massachusetts	105	115	3	-97.1

Table 4 (Continued)

NUMBER OF PROVIDER NUMBERS, BY CARRIER, 1986 - 1988

	1986	1987	1988	% Change
Michigan 00710 BC & BS of Michigan	722	703	669	-7.3
Minnesota 00720 BC & BS of Minnesota	84	79	78	-7.1
Minnesota 10240 The Travelers Insurance Company	121	112	116	-4.1
Missouri 11260 General American Life	247	240	221	-10.5
Mississippi 10250 The Travelers Insurance Company	269	224	226	-16.0
Montana 00751 BS of Montana	93	98	89	-4.3
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	408	437	401	-1.7
N. Dakota & S. Dakota 00820 BS of North Dakota	81	90	134	65.4
Nebraska 00645/00655 BC of Iowa BS of Kansas	124	111	112	-9.7
New Hampshire & Vermont 00780 BC & BS of Massachusetts	121	124	3	-97.5
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	632	669	913	44.5
New Mexico 01360 Aetna Life & Casualty Company	117	110	140	19.7
Nevada 01290 Aetna Life & Casualty Company	88	86	91	3.4

Table 4 (Continued)

NUMBER OF PROVIDER NUMBERS, BY CARRIER, 1986 - 1988

	1986	1987	1988	% Change
New York 00801 BS of Western New York	497	507	508	2.2
New York 00803 Empire BC & BS	2,334	2,325	2,447	4.8
New York 14330 Group Health Incorporated	198	204	194	-2.0
Ohio 16360 Nationwide Mutual Insurance Company	1,272	1,208	1,134	-10.8
Oklahoma 01370 Aetna Life & Casualty Company	320	341	335	4.7
Oregon 01380 Aetna Life & Casualty Company	298	299	306	2.7
Pennsylvania 00865 Pennsylvania BS	987	982	1,658	68.0
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	236	223	134	-43.2
Rhode Island 00870 BS of Rhode Island	96	92	98	2.1
Railroad 10071 The Travelers Insurance Company	12,530	12,284	12,005	-4.2
South Carolina 00880 BC & BS of South Carolina	238	256	283	18.9
Tennessee 05440 Equicor, Inc.--Equitable Corporation	310	317	253	-18.4
Texas 00900 Group Medical/Surgical Services	1,680	1,779	1,722	2.5

Table 4 (Concluded)

NUMBER OF PROVIDER NUMBERS, BY CARRIER, 1986 - 1988

	1986	1987	1988	% Change
Utah 00910 BS of Utah	118	122	123	4.2
Virginia 10490 The Travelers Insurance Company	329	248	246	-25.2
Washington 00930 Washington Physician Service	466	468	472	1.3
Wisconsin 00951 Wisconsin Physicians' Service Corporation	297	415	389	31.0
West Virginia 16510 Nationwide Mutual Insurance Company	224	215	196	-12.5
Wyoming 05530 Equicor, Inc.--Equitable Corporation	31	27	18	-41.9

* Data processed by Massachusetts Blue Shield (Maine, New Hampshire and Vermont, and Massachusetts) is not inluded in the total for all carriers in 1986, 1987, and 1988 because the 1988 data was incomplete.

In the three years examined in our study, the number of provider numbers on which data were reported increased 1%. However, for some carriers, there is substantial variation in the number of provider numbers on which data are included. Suspicious differences in providers numbers in the three years are shown for 32 carriers. Twenty carriers (Alabama, Colorado, Connecticut, Iowa, Idaho, Indiana, Kansas, Kansas/Missouri, Kentucky, Massachusetts, Maine, Missouri, Mississippi, New Hampshire/Vermont, Ohio, Puerto Rico, Tennessee, Virginia, West Virginia, Wyoming) show more than 10% decreases in the number of provider numbers over the three year period. Twelve carriers (Alaska, District of Columbia, Delaware, Florida, Georgia, Hawaii, North Dakota/South Dakota, New Jersey, New Mexico, Pennsylvania, South Carolina, Wisconsin) show increases of more than 10%. This kind of variation over time seems unlikely and may signal an area of data reporting which warrants additional attention by HCFA.

Table 5 shows the average number of beneficiaries for whom an approved claim was processed per provider number. This number is calculated by summing the number of beneficiaries having an approved Medicare claim processed per provider number and averaging that number across all provider numbers. It is not the total number of beneficiaries having an approved claim processed divided by the total number of provider numbers. The mean number of beneficiaries per provider number increased 43%, from 151 beneficiaries per provider number to 215 beneficiaries per provider number over the three year period. We cannot determine from the data we have available whether this is due to more beneficiaries meeting the deductible or to more beneficiaries using services.

Note in examining these data that one reason for the extreme values for railroad beneficiaries is because of their national coverage. For the Delaware carrier their high value may be because they process all the data from a large multistate laboratory chain. However, the large number (1,321) of beneficiaries to provider numbers in 1988 for New Jersey is unexamined but could be related to the change in carrier in 1988. Beneficiaries per provider number range from 55-61 in Alaska to 406-606 in Tennessee. This difference is somewhat surprising, although it may be the result of uneven representation of

Table 5

NUMBER OF BENEFICIARIES HAVING AN APPROVED MEDICARE CLAIM PER PROVIDER NUMBER, BY CARRIER, 1986-1988

	1986	1987	1988	% Change
All Carriers	150.6 *	164.7 *	214.7 *	42.6
Alabama 00510 BC & BS of Alabama	200.1	238.9	259.2	29.5
Alaska 01020 Aetna Life & Casualty	54.6	59.7	60.6	10.9
Arkansas 00520 Arkansas BS	195.5	221.1	252.2	29.0
Arizona 01030 Aetna Life & Casualty	223.4	213.1	202.7	-9.3
California 00542 California Physicians Service (d/b/a BS of California)	259.4	255.7	265.1	2.2
California 02050 TransAmerica Occidental Life	194.5	198.0	214.3	10.1
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	140.0	159.1	141.1	0.8
Connecticut 10230 Travelers Insurance Company	281.2	351.6	380.9	35.5
District of Columbia 00580 Pennsylvania BS	184.2	236.0	277.1	50.5
Delaware 00570 Pennsylvania BS	390.4	505.9	556.7	42.6
Florida 00590 BS of Florida	306.7	342.5	360.6	17.6

Table 5 (Continued)

NUMBER OF BENEFICIARIES HAVING AN APPROVED MEDICARE CLAIM PER PROVIDER NUMBER, BY CARRIER, 1986-1988

	1986	1987	1988	% Change
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	220.2	234.4	158.4	-28.1
Hawaii 01120 Aetna Life & Casualty	130.4	117.9	117.8	-9.7
Iowa 00640 BS of Iowa	329.4	369.5	471.2	43.1
Idaho 05130 Equicor, Inc. -- Equitable Corporation	219.4	242.9	224.7	2.4
Illinois 00621 BS of Illinois	271.0	271.2	279.4	3.1
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	259.3	292.7	327.0	26.1
Kansas 00650 BS of Kansas	241.3	293.0	341.7	41.6
Kansas & Missouri 00740 BS of Kansas City	138.2	203.2	157.4	13.9
Kentucky 00660 BC & BS of Kentucky	179.1	239.7	210.6	17.6
Louisiana 00528 Arakansas BC & BS	130.7	191.7	223.5	71.0
Massachusetts 00700 BS of Massachusetts	246.4	303.5	28.5	-88.4
Maryland 00690 BS of Maryland	303.0	347.4	371.9	22.7

Table 5 (Continued)

NUMBER OF BENEFICIARIES HAVING AN APPROVED MEDICARE CLAIM PER PROVIDER NUMBER, BY CARRIER, 1986-1988

	1986	1987	1988	% Change
Maine 21200 BS of Massachusetts	189.2	272.4	437.3	131.1
Michigan 00710 BC & BS of Michigan	278.4	286.7	295.5	6.1
Minnesota 00720 BC & BS of Minnesota	246.8	239.4	275.4	11.6
Minnesota 10240 The Travelers Insurance Company	229.1	240.5	186.9	-18.4
Missouri 11260 General American Life	320.3	374.1	396.1	23.7
Mississippi 10250 The Travelers Insurance Company	247.6	332.6	349.0	41.0
Montana 00751 BS of Montana	219.9	227.9	266.0	20.9
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	241.4	251.0	264.3	9.5
N. Dakota & S. Dakota 00820 BS of North Dakota	295.0	375.6	450.3	52.6
Nebraska 00645/00655 BC of Iowa BS of Kansas	219.4	224.1	295.8	34.8
New Hampshire & Vermont 00780 BC & BS of Massachusetts	308.4	268.8	23.0	-92.5
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	261.6	277.4	1,321.3	405.1

Table 5 (Continued)

NUMBER OF BENEFICIARIES HAVING AN APPROVED MEDICARE CLAIM PER PROVIDER NUMBER, BY CARRIER, 1986-1988

	1986	1987	1988	% Change
New Mexico 01360 Aetna Life & Casualty Company	193.9	215.2	220.2	13.6
Nevada 01290 Aetna Life & Casualty Company	243.9	253.7	285.1	16.9
New York 00801 BS of Western New York	217.7	217.2	227.2	4.4
New York 00803 Empire BC & BS	176.9	189.0	199.9	13.0
New York 14330 Group Health Incorporated	134.4	191.5	167.0	24.2
Ohio 16360 Nationwide Mutual Insurance Company	237.6	257.2	262.0	10.3
Oklahoma 01370 Aetna Life & Casualty Company	183.8	194.7	213.2	16.0
Oregon 01380 Aetna Life & Casualty Company	248.7	250.4	315.5	26.8
Pennsylvania 00865 Pennsylvania BS	336.2	373.4	502.4	49.4
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	151.1	147.4	232.5	53.9
Rhode Island 00870 BS of Rhode Island	401.7	448.8	437.4	8.9
Railroad 10071 The Travelers Insurance Company	12.1	12.7	13.4	11.0
South Carolina 00880 BC & BS of South Carolina	210.6	235.0	258.5	22.8

Table 5 (Concluded)

NUMBER OF BENEFICIARIES HAVING AN APPROVED MEDICARE CLAIM PER PROVIDER NUMBER, BY CARRIER, 1986-1988

	1986	1987	1988	% Change
Tennessee 05440 Equicor, Inc.--Equitable Corporation	406.4	496.5	606.1	49.1
Texas 00900 Group Medical/Surgical Services	166.1	178.2	202.6	22.0
Utah 00910 BS of Utah	204.3	201.2	207.0	1.3
Virginia 10490 The Travelers Insurance Company	192.6	262.6	289.5	50.3
Washington 00930 Washington Physician Service	199.9	216.2	232.7	16.4
Wisconsin 00951 Wisconsin Physicians' Service Corporation	237.2	198.2	298.2	25.7
West Virginia 16510 Nationwide Mutual Insurance Company	195.5	208.6	248.4	27.0
Wyoming 05530 Equicor, Inc.--Equitable Corporation	207.2	231.3	359.7	73.6

* Data processed by Massachusetts Blue Shield (Maine, New Hampshire and Vermont, and Massachusetts) is not inluded in the total for all carriers in 1986, 1987, and 1988 because the 1988 data was incomplete.

different kinds of providers in the carriers' provider files, differences in sampling methodologies, both among and within carriers over the study period, or differences in whether a carrier assigned a unique provider number to a physician or multiple numbers for different practice settings.

Some of the data in Table 4 and Table 5 are difficult to explain when the two tables are examined together. For example, Pennsylvania's provider numbers increased 68% and their number of beneficiaries per provider number increased 49%. Wyoming's number of provider numbers decreased 42% while their number of beneficiaries per provider number increased 74%. Further investigation of these anomalies would require contact with the carrier Regional Office representative and the carrier personal for each carrier in question.

Unexplained anomalies in these two elements, number of provider numbers and number of beneficiaries per provider number, for particular carriers in particular years should be taken into consideration in interpreting the data presented in Table Series 6 discussed in Chapter 4.

Other Technical Investigation Findings

In analyzing and cleansing the BMAD data for the final analysis tables, substantial investigations were made in the following areas: HCPCS Level II and III coding, surgery-related services, and use of modifiers -- particularly modifier 26 ("Professional Component"). These investigations are discussed in some detail below. Understanding the limitations of the source data files utilized in the study is necessary to insure appropriate interpretations of the study results.

The preceding descriptions of the BMAD and eligibility files and the references to the detailed Technical Issues Memoranda strongly suggest that the reliability and consistency of coded data varies considerably on both a national and per carrier basis. Therefore, significant resources were devoted to investigating the data. Analyzing basic distributions from the procedure and provider files identified "problem" fields and gross coding inconsistencies. The HCFA BDMS-prepared "Data Limitations" documents were also consulted. However, the scope of these documents is somewhat limited and their timeliness is an issue. Once the initial table series were generated, data were compared to a variety of sources as a "reality check", to identify large deviations or gross level discrepancies. HCFA studies using these files were consulted. We, in addition, attempted as much as possible to identify differences in provider billing practices, carrier systems and coding conventions, and carrier procedures for creating BMAD data in making decisions about the data selected for the analysis files.

HCPCS Level II and III Code Conversions

To achieve the goal of including the broadest scope of physician services possible for both the procedure file and provider file tables, the validity and applicability of HCPCS Level II and III coding and codes were investigated. The initial Carrier Distribution Tables indicated that Level II codes represented over 11% of total allowed charges. However, by deleting Level II code ranges that represented non-physician service (such as DME, supplies, etc.), this percentage declines to about 2.5%. All of the Level II codes representing physician services in this group were converted to Level I CPT code ranges and/or individual codes where possible, thereby insuring that these physician services were included in all the tables. (Refer to Technical Issues Memo #5 in Appendix A for complete details on how the mapping process was conducted.)

The approach to Level III codes was somewhat different. The Carrier Distribution data indicated that 3.5% of 1986 allowed charges for services (MTUS Indicator equals Services) were associated with Level III codes. This declined to 2.9% in 1988. There was interest in utilizing as large a portion of these allowed charges as possible, while still maintaining some degree of certainty as to their applicability. The June 18, 1990 report to HCFA by Health Economics Research, Inc. (HER)[22] which summarized the results of its process of converting these local (Level III) codes was determined to provide the most timely and accurate source for these data. As Technical Issues Memo #11 (Appendix A) indicates, the decision was made to include in the analysis tables any Level III codes which HER was able to convert to a specific CPT or Level II physician service code. Services that could only be converted to a "type of service" were excluded. The rationale for this decision and some of the potential problems and advantages associated with it, are fully described in Memo #11. The end result of these conversions is that all of the procedure and provider file Table Series 1 through 6 include all of the HCPCS Level II and III coded services that could reasonably be considered to be physician services, based on correlations back to CPT codes and/or ranges of CPT codes.

Surgery-Related Services

Table Series 2 was designed to address HCFA's interest in overall patterns of surgical billings and billings for services related to surgery. While other tables in the study present data for "surgery" as a procedure group, those data are limited to surgical procedure codes (CPT codes 01000 to 69999) per se. Table Series 2 presents data for a wide array of services that are related to surgery. These include surgical procedures, consultations and anesthesia. Technical Issues Memo #6 (Appendix A) provides detailed information about how the seven groupings of surgery-related services were established, and the exact logic that was utilized to select these services from the procedure file. It addresses the limitations of the available data by describing the range of provider and carrier coding practices, common coding errors and anomalies, and the selection logic utilized to address these conditions. While Table Series 2 accumulates all possible surgery-related services in one place, it is important to note when reviewing the data, that their reliability may be impacted by poor coding practices. Specifically, staff from BDMS, the HCFA regional office and carriers have noted that coded data for anesthesia, place and type of service, and consultation are less accurate than for many of the other BMAD data fields.

Use of Modifiers

The initial Carrier Distributions Tables indicated that carriers utilize hundreds of different codes to modify the definition of services provided. These modified services make up a substantial proportion of services and allowed charges. The most frequently utilized modifiers are for professional component, durable medical equipment, ambulance, left and/or right side, reduced and/or greater services, and optometry. Some local modifiers for which no description is available, represent significant volumes for some carriers. (See Attachment 1, Supplemental Table 3, "Carrier Distributions on Modifiers".) Table 6 summarizes the use of modifiers on service by year and carrier. The use of modifiers was greater in 1988 and rose substantially during the study period from 26% of allowed charges (21% of allowed services) in 1986 to 35% of allowed charges (34% of allowed services) in 1988. Individual carriers' use of modifiers varies dramatically. Carriers which have lower than average use of modifiers are Aetna, Travelers, Nationwide, Equicor, Arkansas B/S, Minnesota BC/BS, Group Health, Inc., and Rhode Island B/S. Group Health (GHI) represents an interesting anomaly in that the BMAD data reflect no modifier use in 1986 and 1988, and low use in 1987. This is somewhat supported by HCFA's October 19, 1989 listing of Carrier Modifier Descriptions, which reflected only nine modifiers for GHI. It is more likely, however, that the two zero years reflect BMAD reporting deficiencies by the carrier. Carriers which have a higher than average percentage of their services with modifiers are TransAmerica Occidental, Empire BC/BS and Wisconsin Physicians Service. The modifier description document suggests that differences in the use of modifiers among carriers frequently reflect differences in carrier processing system features which were developed to handle local billing and pricing practices. Wisconsin represents an interesting anomaly because the percent of allowed charges modified varies from 56% to 26% to 74% from 1986 to 1988. Reference to Supplemental Table 3 reflects a widely varying use of at least 10 modifiers, some of which are not described, and none of which appear to be related.

Modifiers can increase, decrease or not affect the dollars allowed by a carrier for a given service. To the extent that modifiers affect the charges

Table 6

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 - 1988

	1986		1987		1988	
	#	$	#	$	#	$
All Carriers	21.0	25.8	25.7	29.9	33.7	34.6
Alabama 00510 BC & BS of Alabama	6.3	10.0	18.3	22.9	20.9	30.0
Alaska 01020 Aetna Life & Casualty	10.9	11.6	15.6	15.7	15.7	16.8
Arkansas 00520 Arkansas BS	27.6	17.6	28.4	17.1	29.4	18.6
Arizona 01030 Aetna Life & Casualty	6.8	5.7	14.0	13.5	17.1	19.1
California 00542 California Physicians Service (d/b/a BS of California)	23.4	28.1	22.9	29.8	26.0	33.9
California 02050 TransAmerica Occidental Life	39.3	55.9	44.5	57.3	50.1	62.0
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	47.9	38.9	43.3	39.8	55.9	36.4

Table 6 (Continued)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 – 1988

	1986		1987		1988	
	#	$	#	$	#	$
Connecticut 10230						
Travelers Insurance Company	9.2	8.2	9.5	9.9	9.7	10.8
District of Columbia 00580						
Pennsylvania BS	32.0	20.2	48.4	29.4	52.4	34.6
Delaware 00570						
Pennsylvania BS	39.0	22.9	70.2	45.7	14.6	13.8
Florida 00590						
BS of Florida	20.9	33.3	18.9	31.2	33.5	38.6
Georgia 13110/01040						
The Prudential Insurance Co. of America						
Aetna Life & Casualty	34.2	32.1	38.2	33.4	38.2	33.7
Hawaii 01120						
Aetna Life & Casualty	3.7	5.0	10.3	11.7	10.9	12.5
Iowa 00640						
BS of Iowa	13.9	13.0	26.7	26.7	38.6	27.8
Idaho 05130						
Equicor, Inc. –– Equitable Corporation	18.9	25.3	20.4	25.3	21.3	26.0

Table 6 (Continued)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 - 1988

	1986		1987		1988	
	#	$	#	$	#	$
Illinois 00621 BS of Illinois	17.7	8.5	25.3	19.4	46.3	32.4
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	22.0	22.4	20.7	19.4	27.4	27.0
Kansas 00650 BS of Kansas	15.4	16.2	46.2	43.9	49.0	48.7
Kansas & Missouri 00740 BS of Kansas City	16.6	19.1	16.7	19.9	16.2	21.7
Kentucky 00660 BC & BS of Kentucky	19.8	23.8	17.9	24.0	20.8	29.7
Louisiana 00528 Arakansas BC & BS	33.5	19.1	32.5	19.2	34.0	21.4
Massachusetts 00700 BS of Massachusetts	6.9	7.7	20.5	18.4	34.3	29.8
Maryland 00690 BS of Maryland	8.0	3.5	23.7	20.7	26.1	24.5

Table 6 (Continued)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES
FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 - 1988

	1986		1987		1988	
	#	$	#	$	#	$
Maine 21200 BS of Massachusetts	5.5	9.6	21.8	24.8	41.9	39.0
Michigan 00710 BC & BS of Michigan	10.9	17.5	32.6	30.9	47.0	35.4
Minnesota 00720 BC & BS of Minnesota	10.4	15.2	13.3	18.9	14.4	19.8
Minnesota 10240 The Travelers Insurance Company	12.1	13.6	9.0	11.0	9.2	10.8
Missouri 11260 General American Life	18.4	19.1	19.8	21.2	21.9	23.5
Mississippi 10250 The Travelers Insurance Company	11.8	12.6	11.9	12.6	12.0	13.3
Montana 00751 BS of Montana	17.9	20.9	39.1	34.9	43.0	37.2
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	42.9	36.1	54.8	39.8	52.5	41.0

Table 6 (Continued)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 - 1988

	1986		1987		1988	
	#	$	#	$	#	$
N. Dakota & S. Dakota 00820 BS of North Dakota	20.6	27.0	28.1	31.6	28.2	31.5
Nebraska 00645/00655 BC of Iowa BS of Kansas	12.0	10.9	26.1	28.0	26.2	28.7
New Hampshire & Vermont 00780 BC & BS of Massachusetts	7.2	10.6	17.9	22.0	35.5	37.0
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	37.2	28.7	41.9	30.8	45.2	33.0
New Mexico 01360 Aetna Life & Casualty Company	0.4	1.1	12.3	12.0	12.9	13.8
Nevada 01290 Aetna Life & Casualty Company	7.2	5.9	17.1	15.0	20.5	21.4
New York 00801 BS of Western New York	11.6	28.4	23.3	30.0	25.5	29.9
New York 00803 Empire BC & BS	65.3	62.4	66.3	63.1	64.0	85.1

Table 6 (Continued)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 – 1988

	1986		1987		1988	
	#	$	#	$	#	$
New York 14330 Group Health Incorporated	0.0	0.0	8.4	10.3	0.0	0.0
Ohio 16360 Nationwide Mutual Insurance Company	2.6	4.9	18.3	18.6	18.1	23.6
Oklahoma 01370 Aetna Life & Casualty Company	3.5	3.4	11.1	11.9	12.0	13.2
Oregon 01380 Aetna Life & Casualty Company	6.9	9.9	12.1	16.3	12.4	17.4
Pennsylvania 00865 Pennsylvania BS	23.5	21.0	36.3	31.2	25.5	23.7
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	15.2	18.0	13.7	18.2	13.4	20.8
Rhode Island 00870 BS of Rhode Island	5.3	3.9	14.9	9.9	15.5	11.3
Railroad 10071 The Travelers Insurance Company	11.6	11.4	11.1	11.0	10.4	11.0

Table 6 (Concluded)

PERCENTAGE OF SERVICES AND ALLOWED CHARGES FOR PROFESSIONAL SERVICES FOR WHICH MODIFIERS ARE USED, BY CARRIER, 1986 - 1988

	1986		1987		1988	
	#	$	#	$	#	$
South Carolina 00880 BC & BS of South Carolina	7.2	22.9	2.4	19.5	23.7	27.8
Tennessee 05440 Equicor, Inc.--Equitable Corporation	18.6	28.8	19.2	28.2	19.9	28.1
Texas 00900 Group Medical/Surgical Services	26.2	30.2	32.0	32.7	38.8	32.3
Utah 00910 BS of Utah	29.5	35.4	44.6	46.3	47.2	46.8
Virginia 10490 The Travelers Insurance Company	12.8	14.6	13.0	14.7	12.6	15.3
Washington 00930 Washington Physician Service	21.1	11.5	30.8	19.3	34.7	20.1
Wisconsin 00951 Wisconsin Physicians' Service Corporation	58.2	55.8	34.0	26.2	76.6	73.6
West Virginia 16510 Nationwide Mutual Insurance Company	2.9	4.3	19.9	18.3	19.5	19.5
Wyoming 05530 Equicor, Inc.--Equitable Corporation	23.5	30.0	22.7	29.8	25.6	30.7

allowed, allowed charges per RVUs which is presented in all the table series basic tables is affected (refer to Technical Issue Memo #8 in Appendix A). One way to reduce this impact would have been to change the RVU for any modified service which would result in a higher or lower allowed charge because of the presence of the modifier. For example, if modifier 22 (unusual services) always meant that the allowed charge for the procedure would be increased be 25%, then the RVU could be multiplied by 1.25. However, it is not common to be able to translate a modifier into a specific percentage of allowed charges.[23] In addition, in order to do this we would need to have detailed data about each modifier used for each carrier including the carriers' definitions and related pricing policies. Such data are not available. Therefore, the data presented do not take account of modifiers. Because such a substantial percentage of allowed services and charges are modified, deletion of all modified procedure codes was not seriously considered as an alternative. Therefore, the study data and results have undoubtedly been impacted by this factor in unknown ways. The use and impact of modifiers clearly represents an issue that bears further study.

Modifier 26 "Professional Component" Usage

Because the occurrence of modifier 26 was so much greater than any other modifier (see Technical Issues Memo #8), some further investigation was made in this area. The professional component, modifier code 26, is used when billing the physician's portion of purchased diagnostic services, i.e., radiology services in the CPT 70000 series, laboratory services in the CPT 80000 series, and selected diagnostic procedures in the CPT 93000, 94000 and 95000 series. Table 7 displays the percent of allowed charges for each of these three types of service, that were modified by code 26. The sharpest rise (289%) was for the special diagnostic procedures, and the largest proportion of services affected were radiology services.

The laboratory data should reflect the determination made in 1984 that there should be no professional component lab fee schedules for "clinical" lab procedures. Professional components would only be allowed for the anatomical

Table 7

PERCENTAGE OF ALL ALLOWED CHARGES ACCOUNTED FOR BY SERVICES WITH MODIFIER 26, BY TYPE OF SERVICE, 1986 – 1988

	1986	1987	1988	% Change
Special Diagnostic Procedures (92950-95999, MO399-MO592)	10.4	27.5	40.7	289.2
Radiology	34.0	50.8	54.3	60.0
Laboratory	7.8	12.5	15.9	104.6

pathology 88300 series codes. Supplemental Table 4, "National Allowed Charges with and without Modifier 26" (see Attachment 1) generally reflects this practice, although clearly BMAD still contains some inappropriately modified lab services during the study period.

Statutory, regulatory and billing changes and carrier practices were explored to determine what factors might have impacted the radiology and diagnostic services upward trends. In an attempt to bring some consistency to reimbursement policies for like services provided in different settings, TEFRA required that hospital-based physicians (HBP) bill their portion of outpatient hospital services (the professional component) directly to the carriers for pricing according to reasonable charge screens. (The technical portion of outpatient services was to be billed to the intermediary for payment of a blended rate based on carrier fee data and the hospital's cost report data.) This policy eliminated the former practice of "combined billing" for both components by the hospital to the intermediary. Many hospitals did not wish to bill the carriers for the physician fee, consequently HBPs who had previously been employees entered into contractual relationships with the hospitals, thus assuming the Medicare Part B billing function.

To respond to this policy change, carriers had to alter their systems to develop professional component fee schedules and methods for determining when billings were from HBPs, so that pricing could be performed at the appropriate level. While HBPs may have been instructed to utilize modifier 26 to identify their services, this did not occur with consistency, according to HCFA regional office staff. Other carrier safeguards had to be instituted. For example, in 1986, Blue Shield of California adopted an edit routine that identified billings for diagnostic procedure codes with place of service code equal to inpatient hospital or outpatient hospital. Their system then inserted a modifier 26 for pricing purposes if one was not present. TransAmerica Occidental assigned special provider numbers to HBPs to aid them in appropriately pricing these services. Carrier awareness of the need for safeguards varied, however, as did the variety and timeliness of their implementation.

In addition, it became apparent in 1989 when radiology fee schedules were introduced, that there had previously been some confusion in both the provider and carrier community, about how to bill for "complete" procedures, and for procedures involving only "supervision and interpretation." For example, the CPT 75000 series has codes for both "complete" procedures, and for "supervision and interpretation". A "complete" procedure is one where the radiologist gives both the injection and performs the diagnostic procedure. "Supervision and interpretation" codes should be billed when the radiologist performs the radiology diagnostic procedure, but someone else gives the injection. These are not to be confused with the "technical" and "professional" components defined above which are identified by modifiers. Billing practices did not seem to consistently reflect these policies during the study period.

Therefore, it appears from these investigations that the presence of modifier 26 codes on diagnostic procedure codes was variously affected by the changes in HBP billing requirements, the degree of sophistication of carrier detection of incorrect billing practices, and confusion about the correct use of modifiers for certain types of codes.

4. FINDINGS

In this section we discuss the main findings from this investigation. Attachment 2 to this report consists of detailed tables which present more comprehensive information related to the specific data discussed in this report. The findings are divided into four sections. The first three sections are analyses of procedure file data. The final section presents the provider file analysis. In the first part we discuss the changes from 1986 to 1988 in services, RVUs, allowed and billed charges per eligible and per user using the procedure file. We then examine the same data for special procedure groups and look at the most commonly occurring and most costly procedures. Finally, we discuss findings from our analysis of the provider file which examines growth from 1986-1988 in number of provider numbers, beneficiary/provider number combinations, services, RVUs, allowed and billed charges per provider number and per beneficiary/provider number combination. Note that the provider file analysis is restricted to the claims associated with 5% of the provider numbers selected by the carriers, while the procedure file contains summary information accumulated by the carrier on all services processed.

Changes in Selected Utilization Measures, 1986-88

The top part of Table 8 shows summary information across all types of services, places, and specialties on the overall growth in various utilization measures. The data presented are restricted to services (where the MTUS indicator is equal to 3) in the data files.

In general, substantial growth is shown on all the utilization measures examined. The overall number of services has increased 19%, RVUs 17%, allowed charges 27%, billed charges 28%. Because the numbers of eligibles and users are increasing, when the data are examined per eligible and per user, the

Table 8

GROWTH IN SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 - 1988

	1986	1987	1988	% change
# Services	551,813,965	601,499,197	654,638,959	18.63
# Services per User	23.673462	24.927175	26.257221	10.91
# Services per Elig	19.048873	20.525864	22.018900	15.59
# RVUs	5,740,511,576	6,229,140,687	6,740,665,114	17.42
# RVUs per Service	10.402983	10.356024	10.296767	-1.02
Allowed $	20,955,365,964	24,498,062,029	26,555,039,543	26.72
Allowed $ per RVU	3.650435	3.932815	3.939528	7.92
Allowed $ per Elig	723.388945	835.984320	893.183587	23.47
Billed $	29,232,862,596	33,494,013,650	37,454,670,217	28.13
Billed $ per RVU	5.092379	5.376987	5.556524	9.11
Billed $ per Elig	1,009.131966	1,142.966745	1,259.794649	24.84

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	20.6	7.7	12.4	10.8	0.7	4.2	15.3	18.7
CA Occidental	24.2	9.8	8.6	10.7	2.0	4.0	15.9	21.0
TX	18.2	26.4	18.5	10.6	-1.5	7.1	38.7	37.1
FL	18.7	49.6	48.1	11.9	-15.8	14.6	59.7	58.2
IL	18.3	7.3	1.6	12.9	-17.6	37.2	24.0	15.2
MI	21.0	13.0	5.6	9.9	4.8	-3.0	19.1	22.2
OH	20.9	-1.1	-5.0	9.5	7.4	19.4	36.6	33.0
NJ	21.5	7.5	7.5	9.5	6.0	4.5	14.4	17.5
NY Empire	20.8	11.5	8.1	9.8	3.4	5.2	19.1	17.6
PA	20.6	-5.8	-9.0	10.2	1.1	10.2	5.8	8.6

percentage increases shown above are smaller. As was seen in Tables 1 and 2, Medicare person-years of eligibility have increased 3.4% from 1986 to 1988 to approximately 31.5 million person-years. Excluding HMO person-years of eligibility during which data are generally not processed through the carriers, Medicare person-years of eligibility increased 3% from 1986 to 1988. The percentage of eligibles with use increased from 78% in 1986 to 80% in 1988. Thus the per user rates of increases in the utilization measures increased more slowly than the eligibility rates of increase. The rate of increase in rates per eligible for services are 16% compared to 11% for users. For allowed charges the increase in the rate per user was 23% as compared to 19%. For billed charges it was 26% as compared to 21%.

RVUs are of importance in this analysis because they provide us with an intensity measure for services billed. As discussed earlier in this report, RVUs used in this analysis were from the HCFA-supplied HCPCS tape Description File. Because RVUs existed in the BMAD file that were not in the HCPCS file we imputed these missing RVUs. Technical Issue Memo #2 describes this process. Supplemental Table 2 shows the RVU values used for each procedure code in the BMAD data files. Note also that modifiers are ignored in assigning RVU values to procedure codes. This means that to the extent that modifiers affect the intensity of services performed and the incidence of modifiers of this type has changed, the change in measures involving RVUs (RVUs per service, allowed charge per RVU, billed charge per RVU) would be misstated.

When measures of service intensity are considered, RVUs per service decreased 1%. This represents an increase in the use of lower valued procedures. For measures of price, allowed charges per RVU and billed charges per RVU increased 8% and 9% respectively. These price variables measure the increase in charges adjusted for intensity of service. However, it should be noted that the allowed and billed charge per RVU increase was almost entirely during the period 1986-1987. Only a small amount of the increase from 1986-1988 for allowed and billed charges per RVU was in the period 1987-1988.

By Carrier

The bottom part of the table presents summary information by carrier for the 10 carriers having the most eligibles and allowed charges. Together these 10 carriers account for 47% of the person-years of eligibility and 55% of the allowed charges. They are arranged by area of the country. The two California carriers (West) followed by Texas (Southwest), Florida (South), the three Midwest carriers (Illinois, Michigan and Ohio), and three Eastern carriers [New Jersey, New York (Empire), and Pennsylvania].

The columns of the bottom half of the table define important utilization values and increases in utilization values to be compared across the 10 carriers and against the total for all carriers in the top of the table. These 8 columns in order from left to right are: number of services per eligible in 1986, percent change in number of services per eligible from 1986-1988, percent change in number of services per user from 1986-1988, number of RVUs per service in 1986, percent change in RVUs per service 1986-1988, percent change in allowed charges per RVU, percent change in allowed charges, percent change in billed charges.

As can been seen in the table, there is considerable variation by carrier. While in general the increase in number of services per eligible was 16%, the carriers presented here have ranged from a decrease of 6% (Pennsylvania) to an increase of 50% (Florida). Two of the three carriers which were the lowest utilizers in 1986 had the largest increase. The number of RVUs per service in general tended to decrease slightly but only 3 of the carriers presented show negative changes in RVUs per service. These were Illinois (-18%), Florida (-16%) and Texas (-2%). In general, they were states which had relatively high RVUs per service in the base year. Allowed charges per RVU increased for all the carriers listed except Michigan. The rate of increase was highest for Illinois followed by Ohio and Florida. Some of these increases may be caused in part by the ignoring of procedure modifiers in assigning RVU values discussed above. More moderate increases were found for New Jersey and the two California carriers. Allowed and billed charges went up very dramatically for Florida, Texas and Ohio. The increase in allowed and billed charges in Florida and Texas is being driven by a large increase in the number of services per eligible. The increase in Ohio is due more to an increase in price and in the intensity of service used. For more complete examinations it would be necessary to contact the Regional Office carrier representative and carrier personnel.

By Procedure Group and Carrier

The top of Tables 9 through 12 gives the national averages for all utilization variables for medical procedures, surgical procedures, radiology procedures and laboratory procedures. The bottom part of the tables show the distribution along eight of these utilization variables and increase in utilization for the ten carriers having the largest number of person-years of eligibility, and the largest amount of allowed charges processed. These eight variables are the same as in Table 8.

Medical Procedures

Allowed charges for medical procedures, about 9 billion dollars in 1986, make up 44% of total allowed charges (Table 9). The percentage of total charges for medical procedures has remained relatively stable from 1986-88. In 1988, medical services allowed charges were more than 11.7 billion dollars.

Medical services per eligible have increased less than total services per eligible (9% as compared to 16%). However, medical RVUs per service have increased slightly (+3%) where all services showed a decline (-1%). Allowed charges per medical RVU also increased faster than allowed charges per all RVUs (10% as compared to 8%). However, as with the national data, most of the increase in allowed dollars per medical RVU is in the 1986-1987 period.

For medical services, the increase in number of services per eligible was greatest for Florida (+45%) and to a lesser extent Michigan (+23%) and Texas (+15%). As was the case for total services, these were carriers where the

Table 9

GROWTH IN MEDICAL SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	310,837,002	335,212,080	349,057,345	12.30
# Services per User	13.335269	13.891773	14.000505	4.99
# Services per Elig	10.730237	11.438947	11.740607	9.42
# RVUs	2,457,074,306	2,677,466,638	2,834,111,552	15.34
# RVUs per Service	7.904703	7.987381	8.119329	2.72
Allowed $	9,199,785,391	10,893,211,428	11,720,287,709	27.40
Allowed $ per RVU	3.744203	4.068476	4.135436	10.45
Allowed $ per Elig	317.580855	371.725483	394.214010	24.13
Billed $	12,576,251,192	14,413,896,799	15,896,497,819	26.40
Billed $ per RVU	5.118384	5.383408	5.608988	9.59
Billed $ per Elig	434.138020	491.867140	534.681597	23.16

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	12.0	3.2	7.6	7.6	3.3	7.6	17.0	16.9
CA Occidental	13.6	-1.1	-2.1	8.1	9.8	9.9	18.7	19.1
TX	10.3	14.8	7.6	7.5	6.3	10.7	40.5	34.8
FL	9.3	45.0	43.6	9.5	-8.6	27.5	87.0	82.6
IL	11.4	1.2	-4.3	8.4	-2.7	20.5	21.2	13.4
MI	9.2	22.8	14.8	8.4	-1.1	-10.6	12.7	15.0
OH	10.7	5.4	1.2	7.6	6.2	16.0	39.8	28.3
NJ	11.2	2.3	2.2	8.1	2.1	7.8	8.1	10.5
NY Empire	12.5	7.1	3.7	7.9	2.0	7.8	15.6	12.7
PA	12.6	-7.9	-11.1	8.2	-2.0	14.3	3.8	5.3

number of services per eligible was relatively low in 1986. The number of RVUs per medical service decreased for the four carriers with the highest number of medical RVUs per service in 1986. Florida decreased 9%, Illinois 3%, Pennsylvania 2% and Michigan 1%. Two of these four carriers (Florida and Illinois) also had decreases in the number of RVUs per service. Although for the nation, allowed charges per medical RVU increased 10%, allowed charges per medical RVU decreased for Florida (-8.6%). Florida leads the ten biggest carriers in its increase in allowed charges per medical RVU (+28%). This was more than the national increase shown for all services (28% as compared to 8%). Allowed and billed charges increases for Florida are very dramatic increases (87% and 83%). Texas and Ohio also have very large increases in medical procedures allowed and billed dollars: 41% (allowed) and 35% (billed) for Texas and 40% (allowed) and 28% (billed) for Ohio.

Surgical Procedures

Surgical procedures allowed charges make up about 37% of total charges, $7.8 billion in 1986 (Table 10). The percentage that surgical procedures make up of the total has decreased slightly from 37.1% in 1986 to 35.8% in 1988. In 1988 total allowed charges for surgical procedures were $9.5 billion.

The number of surgery services increased dramatically (46% over the time period). However, this increase was linked to a strong decrease in the intensity of surgical service use with surgical RVUs per service decreasing 21%. Allowed charges per surgical RVU increased 6%. The increase would have been slightly higher if only the 1986-1987 period was considered. Further investigations of the increase in number of surgical services indicates that this finding is due to a sharp increase in the use of relatively minor procedures such as blood drawing, injections and minor surgical procedures. Most of this increase also appears to be based on procedures by provider numbers which are not identified as surgical specialties.

The strong percentage increases in number of services per eligible and the strong decreases in the number of RVUs per service are within the general

Table 10

GROWTH IN SURGICAL SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	45,767,483	58,221,351	66,665,753	45.66
# Services per User	1.963478	2.412794	2.673928	36.18
# Services per Elig	1.579914	1.986774	2.242314	41.93
# RVUs	97,163,042	105,041,095	112,182,335	15.46
# RVUs per Service	2.122971	1.804167	1.682758	-20.74
Allowed $	7,783,832,805	8,901,966,129	9,505,831,217	22.12
Allowed $ per RVU	80.111044	84.747461	84.735544	5.77
Allowed $ per Elig	268.701516	303.775216	319.730362	18.99
Billed $	10,970,933,229	12,472,318,846	13,743,202,685	25.27
Billed $ per RVU	112.912615	118.737517	122.507725	8.50
Billed $ per Elig	378.721700	425.611747	462.255123	22.06

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	2.3	16.1	21.1	1.9	-8.4	2.5	11.2	17.1
CA Occidental	1.6	88.7	86.7	3.0	-39.9	-1.6	11.0	21.1
TX	1.5	54.8	45.0	2.4	-21.7	5.2	32.6	34.1
FL	1.7	105.3	103.2	2.3	-45.0	5.3	31.6	32.4
IL	1.2	54.5	46.2	3.5	-50.1	57.3	23.9	13.6
MI	2.4	-11.2	-17.0	1.4	28.2	3.7	22.5	24.2
OH	1.7	37.3	31.9	1.7	-16.1	7.0	32.7	34.6
NJ	1.9	13.0	13.0	1.6	5.8	0.1	14.9	18.2
NY Empire	1.6	45.4	40.9	2.0	-18.8	0.9	16.9	18.1
PA	1.9	4.3	0.7	1.5	-7.2	3.0	0.4	5.4

practice, medical specialties and other specialty groups (see Table 14). Note that dermatologists who use many surgical codes for dermatological surgery are classified as medicine specialists and that radiologists who provide a number of diagnostic procedures involving injections are in the "other specialties" group. It also should be noted that the most common surgical procedure number, routine venipuncture for the collection of specimen(s) (see Table 26), increased in use by 126% over this period, resulting in 77.7 million dollars in allowed charges in 1988 (Table 27). This may be a procedure where the collection cost was previously included as part of another procedure charge (for example, the office visit or a laboratory charge) but by 1988, the practice developed of charging separately for this service.

The bottom of Table 10 shows tremendous variation in the use variables by carrier. Florida increased 105% in its number of surgical services per eligible and Michigan decreased its number by 11%. Southern California (Occidental) increased in the number of surgical services per eligible by 89%, Texas 55% and Illinois 55%. RVUs per service decreased for everyone except Michigan and New Jersey where they increased 28% and 6% respectively. The decrease was most pronounced for Illinois, Florida and Southern California. Illinois' allowed charges per RVU look very different than the other carriers. It increased by 57%. Changes for the other carriers were in the -2% to +7% ranges. Allowed charges went up substantially for Ohio, Texas and Florida.

This demonstrates a differential pattern of surgical procedures increases by carrier. Florida shows large increases in surgical service use (105%) and a dramatic decrease in RVUs per service (-45%). Southern California, Illinois, Texas, New York (Empire) and Ohio also demonstrate a similar but less pronounced pattern. Northern California and Pennsylvania show the pattern but not so dramatically. New Jersey shows a 13% increase in the number of services per eligible and 6% increase in allowed charges per RVU. Michigan shows an 11% decrease in services per eligible and a 28% increase in number of RVUs per service, completely against the trend. It may indicate that providers in some of the states appear to be billing these smaller surgical procedures on a more regular basis than in other carrier areas.

Radiological Procedures

Allowed charges for radiological procedures were 2.6 billion in 1986 rising to 3.5 billion in 1988 (Table 11). They represented approximately 12% of all charges: 12.4% in 1986, 12.5% in 1989 and 13.0% in 1988. The number of radiological services per eligible increased 9%, less than the percent increase in number of services per eligible found for all services. The intensity of radiology services billed increased 7% and the allowed charges per RVU increased 11%. Again, this increase in allowed charge per RVU is primarily in the 1986-1987 period. The increases reported are a little larger than those reported for medical services, resulting in a 33% increase in allowed charges for radiology as compared to a 27% for medical services.

The changes in the number of services per eligible by carrier ranged from a 4% decrease for Pennsylvania to a 18% increase for Texas. With respect to intensity of services, most of the carriers saw increases ranging from 5% to 15%, however, one carrier, Illinois, showed a 17% decrease. Illinois also showed a dramatic increase in allowed charges per RVU that might point to a problem in that carrier's coding which has resulted in higher RVUs per service in 1986. In 1986, Illinois' number of RVUs per service were the highest of all the ten biggest carriers, 8.8 as compared to a carrier average of 6.8 in that year. Other than Illinois where the data look suspicious, Ohio had the largest increase in allowed charges per RVU averaging 21% followed by Pennsylvania at 17%. Five carriers' increases ranged from 7% to 10% in allowed charges per RVU. Two carriers (Michigan and Northern California) had increases of 1% to 2%.

Laboratory Procedures

Laboratory procedures accounted for 1.4 billion dollars in allowed charges in 1986 (Table 12). They made up 7% of total allowed charges in 1986, 1987 and 1988 with their allowed charges rising to 1.6 billion in 1987 and 1.9 billion in 1988. Laboratory growth in number of services (28% versus 19%) and

Table 11

GROWTH IN RADIOLOGY SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 – 1988

	1986	1987	1988	% change
# Services	68,103,072	72,374,574	76,369,120	12.14
# Services per User	2.921701	2.999328	3.063124	4.84
# Services per Elig	2.350949	2.469746	2.568689	9.26
# RVUs	463,115,706	499,590,964	556,094,465	20.08
# RVUs per Service	6.800217	6.902851	7.281666	7.08
Allowed $	2,608,172,805	3,073,892,124	3,460,826,803	32.69
Allowed $ per RVU	5.631795	6.152817	6.223451	10.51
Allowed $ per Elig	90.035334	104.895057	116.405539	29.29
Billed $	3,542,420,614	4,089,701,448	4,763,059,498	34.46
Billed $ per RVU	7.649104	8.186099	8.565198	11.98
Billed $ per Elig	122.286001	139.559050	160.206373	31.01

By Selected Carrier

	# Services/Eligible		% Change In Services/User	# RVUs/Service		% Change in Charges		
	1986	% Change		1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	2.2	4.8	9.3	6.9	8.8	1.7	18.2	23.1
CA Occidental	2.5	4.9	3.8	6.5	8.6	8.7	23.1	26.2
TX	2.3	17.5	10.1	6.5	7.3	10.4	44.7	42.2
FL	2.5	12.0	10.9	7.2	10.3	10.3	50.7	52.5
IL	2.4	1.4	-4.1	8.8	-16.9	56.7	34.9	22.5
MI	3.0	12.9	5.4	7.0	8.5	1.1	28.3	37.5
OH	2.9	-0.4	-4.3	6.4	5.0	20.7	36.0	36.9
NJ	2.1	17.2	17.2	6.9	14.6	6.7	37.7	45.5
NY Empire	2.2	11.2	7.8	6.5	14.5	9.2	36.6	31.5
PA	2.8	-4.1	-7.4	7.1	10.5	16.8	24.7	24.5

Table 12

GROWTH IN LABORATORY SERVICES, RVUs, AND ALLOWED AND BILLED CHARGES
1986 - 1988

	1986	1987	1988	% change
# Services	127,106,408	135,691,192	162,546,741	27.88
# Services per User	5.453013	5.623279	6.519663	19.56
# Services per Elig	4.387772	4.630395	5.467289	24.60
# RVUs	1,777,480,197	1,936,732,672	2,395,474,733	34.77
# RVUs per Service	13.984190	14.273090	14.737144	5.38
Allowed $	1,363,574,963	1,628,992,348	1,868,093,814	37.00
Allowed $ per RVU	0.767139	0.841103	0.779842	1.66
Allowed $ per Elig	47.071239	55.588562	62.833675	33.49
Billed $	2,143,257,561	2,518,096,557	3,051,910,215	42.40
Billed $ per RVU	1.205784	1.300177	1.274031	5.66
Billed $ per Elig	73.986244	85.928806	102.651555	38.74

By Selected Carrier

	# Services/Eligible		% Change In	# RVUs/Service		% Change in Charges		
	1986	% Change	Services/User	1986	% Change	Al/RVU	Allowed	Billed
CA Blue Shield	4.1	17.8	23.0	14.3	5.7	-3.1	23.2	32.3
CA Occidental	6.5	15.6	14.3	14.2	4.1	-6.7	11.7	24.5
TX	4.1	50.5	41.0	14.8	2.3	-5.0	52.1	55.0
FL	5.1	57.1	55.5	14.7	2.8	-0.6	77.7	79.8
IL	3.3	15.1	8.9	15.1	-2.8	12.2	28.3	25.3
MI	6.4	7.9	0.8	14.3	8.6	-1.3	19.9	20.1
OH	5.6	-25.7	-28.7	16.6	-18.1	115.1	40.8	48.7
NJ	6.4	11.9	11.9	15.0	3.3	5.7	17.4	18.1
NY Empire	4.5	12.0	8.5	12.8	11.7	10.1	35.3	33.0
PA	3.4	-4.9	-8.2	14.3	10.2	2.7	8.4	15.8

intensity of service (5% versus -1%) was faster than for all services, but allowed charges per RVU decreased at a slower rate (2% versus 8%). Note that this allowed charge per RVU increased 10% from 1986 to 1987 but decreased 8% from 1987 to 1988. This may be the result of the phasing in of the laboratory fee schedule described earlier in this report. National limitations on lab reimbursement were imposed and tightened throughout the study period. This is of special interest because it represents a reversal of the increase in each study year found for all the other procedure groups.

The ten largest carriers exhibited patterns which are in general consistent with the imposition of the fee limitations. One exception, however, is Ohio which shows a decrease rather than an increase in the number of services per eligible and a decrease rather than an increase in number of RVUs per service. This results in a very large increase in the allowed charges per RVU (+115%). Most carriers show increases in the number of services per eligible (in the case of Florida and Texas there are very substantial increases of 57% and 51% respectively). In addition, most carriers show small or moderate increases in the number of RVUs per service. Except for Ohio, the percentage change in allowed charges per RVU ranges between -7% and +12%.

This pattern of a constraint in price (allowed charges per RVU) appearing to be associated with the provision of more and more intense services is troubling but not inconsistent with the literature[24]. It thus appears that the success of the laboratory fee schedule phase-in measured in terms of moderating the increase in allowed charges per RVU may have resulted in offsetting increases in the use and intensity of the tests ordered. Because the coinsurance provisions of Medicare have been waived, this is especially problematic and suggests a fee schedule approach to physician fee payment reform may have unintended budget consequences. The phasing in of the schedule, which has resulted in overall lower allowed charges per RVU, may not be promoting the most efficient and effective delivery of laboratory services to Medicare beneficiaries. More study is clearly warranted in this area.

By Place of Service and Procedure Group

Table 13 presents five selected variables for all procedures, medical procedures, surgical procedures, radiological procedures, and laboratory procedures by place of service. The first two of these utilization variables are measures of use, the use in the base year 1986 and the percentage change from 1986 to 1988. The next two variables are measures of service intensity, the numbers of RVUs per service in 1986, and the percentage change in RVUs per service from 1986 to 1988. The last variable could be considered a price variable, the percent change in allowed charges per RVU from 1986 to 1988.

The majority of services in 1986 were provided in office settings, i.e., 9.3 (or 49%) of the 19.0 services per eligible in 1986 had a place of service of office. Twenty-eight percent of the services were inpatient hospital services, 8% were outpatient hospital and 16% were services delivered in other places of service, such as SNF, ASC, or laboratory.

Overall, inpatient hospital service use increased more slowly than services in other places of service (5% for inpatient hospital services as compared to 16% for all services). Intensity of service use decreased in other places (-3%) and increased in the outpatient hospital setting (+12%) but remained reasonably stable in the office and inpatient hospital place of service (1.2% and .1% respectively). Changes in price were greatest for office and hospital services (about 9%). The rates of increase for outpatient hospital and other places were 3% and 4% respectively.

For medical procedures, 53% of all services in 1986 were office services, 36% were inpatient hospital, 6% were outpatient hospital and 6% were services with other places of service.

The rate of increase in use was greatest for office visits (13%), however, their intensity increase was smallest (2%) and their prices went up 10%. Intensity increased most rapidly for outpatient hospital medical services even though the base RVUs per service in 1986 were the highest for outpatient hospital of the four places of service. As with all services, the

Table 13

GROWTH IN SERVICES, RVUs*, ALLOWED AND BILLED CHARGES FOR ALL SERVICES, MEDICAL SURGICAL, RADIOLOGICAL, AND LABORATORY PROCEDURES, BY PLACE, 1986 – 1988

	# of Services/Eligible		#RVUs/Services		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
All Services	19.049	15.6	10.403	−1.0	7.9
Office	9.274	16.2	6.470	1.2	9.5
Inpatient Hospital	5.353	4.8	17.117	0.1	9.4
Outpatient Hospital	1.465	14.8	19.709	12.2	3.4
Other	2.958	33.7	5.973	−3.1	4.4
Medical Procedures	10.730	9.4	7.905	2.7	10.5
Office	5.634	12.6	6.782	2.4	10.2
Inpatient Hopsital	3.896	5.8	9.242	2.7	11.6
Outpatient Hospital	0.607	6.9	9.373	12.3	6.5
Other	0.594	5.4	8.278	2.6	10.3
Surgical Procedures	1.580	41.9	2.123	−20.7	5.8
Office	0.940	49.2	0.538	−23.1	11.9
Inpatient Hospital	0.281	0.9	6.935	1.5	6.1
Outpatient Hospital	0.136	30.6	5.165	1.5	0.0
Other	0.223	69.6	0.894	−20.3	7.1
Radiological Procedures	2.351	9.3	6.800	7.1	10.5
Office	0.625	14.0	5.805	16.7	3.0
Inpatient Hospital	1.013	0.4	7.295	1.4	11.1
Outpatient Hospital	0.652	17.3	7.245	8.8	7.2
Other	0.062	22.8	4.066	10.4	9.1
Laboratory Procedures	4.388	24.6	13.984	5.4	1.7
Office	2.075	11.5	10.123	11.1	0.6
Inpatient Hospital	0.163	15.2	32.539	−4.8	15.3
Outpatient Hospital	0.071	29.9	29.619	4.2	21.9
Other	2.079	38.3	15.845	0.8	−0.6

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* RVUs for all services are medical RVUs. RVUs for medical, surgical, radiological, and laboratory procedures are their own procedure group's RVUs.

percentage change in intensity was the largest and rate of increase in price was smallest for services where place of service equaled outpatient hospital.

Surgical procedures are performed most often in the office (59%) followed by the inpatient hospital (18%), other places (14%) and outpatient hospital (9%). Use of office services and services in other places of service show large increases (49% and 70% respectively). However, these places also show decreases (-23% and -20%) in service intensity. Outpatient hospital surgical service use increased substantially, up 31% from 1986. Inpatient surgical services per eligible increased only .9%. Price increased fastest in the office (+12%) and not at all in the outpatient hospital setting. In other places, surgical services allowed charges per RVU increased 7%, inpatient surgical services allowed charges per RVU increased 6%.

Forty-three percent of radiological procedures were performed in inpatient hospitals, 28% in outpatient hospitals, 27% in the office and 3% in other places of service. Inpatient hospital services had the smallest change in use per eligible (0.4%) and the smallest increase in intensity of services billed (1%), but the largest increase in allowed charge per RVU (11%). Outpatient services increased 17% in use, 9% in intensity and 7% in price. Office visits increased 14% in use, 17% in intensity and 3% in price.

Almost all of laboratory services are either performed in the office (47%), or other places of service (47%). Only 4% are for services where the place of service is inpatient hospital and only 2% for services where the place of service is outpatient hospital. Office laboratory services have increased less rapidly than those in other places of services (12% versus 38%) but their RVU's per service have increased more quickly (11% as compared to 0.8%). The percent change in allowed charge per RVUs for both places has been close to zero at +0.6% for office laboratory service and -0.6% for other place of service laboratory services.

By Specialty and Procedure Group

Table 14 shows use, intensity and price measures by provider specialty from 1986 to 1988. Services delivered by "other" specialists make up the largest number of services per eligible (6.6) followed by those delivered by medical specialists (6.5), general practitioners (3.1) and surgical specialists (2.8). The increases in use are greatest for the other specialists (+23%), but the other specialists show a decrease in intensity of service use (-3%). General practitioners show the smallest increase in use (+7%) and a decrease in intensity (-3%). Both medical and surgical specialists show about the mean increase in use (13% and 14% respectively) and their intensity of services is relatively stable (+.1%, +.9% respectively). Changes in price are greatest for general practitioners (12%) and medical specialists (10%) followed by other specialists (+9%) and surgical specialists (+5%).

For medical procedures, most of the procedures are performed by medical specialists (45%) and general practitioners (21%), although 17% were provided by other specialists and 16% by surgical specialists. Other specialists had the largest increase in medical procedure use (+15%) and medical procedure intensity (+5%) but the smallest increase in price (+9%). Surgical specialists had the next largest increase in use (+12%). Intensity increases were around 2% for general practitioners, medical specialists and surgical specialists.

For surgical procedures, most were performed by surgical specialists (41%), although a large percentage was also performed by medical specialists (31%), other specialists (17%) and general practitioners (11%). Surgical specialists showed the smallest increase in use, and smallest decrease in intensity with a 4% increase in prices. Other specialists had the largest increase in use (66%) but a substantial decrease in intensity (-36%) and a 1% decrease in price. General practitioners and medical specialists both had large increases in use (63% and 54% respectively) and strong decreases in service intensity (-42% and -26%). Both of them also had similar increases in

Table 14

GROWTH IN SERVICES, RVUs*, ALLOWED AND BILLED CHARGES FOR ALL SERVICES, MEDICAL SURGICAL, RADIOLOGICAL, AND LABORATORY PROCEDURES, BY PROVIDER SPECIALTY, 1986 – 1988

	# of Services/Eligible		#RVUs/Services		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
All Services	19.049	15.6	10.403	–1.0	7.9
General Practice	3.146	6.8	6.600	–2.6	11.5
Medical Specialties	6.506	13.4	8.410	0.1	10.1
Surgical Specialties	2.770	13.5	25.489	0.9	4.7
Other Specialties	6.626	22.8	7.858	–2.7	8.7
Medical Procedures	10.730	9.4	7.905	2.7	10.5
General Practice	2.302	2.4	6.867	1.8	11.8
Medical Specialties	4.846	9.7	8.359	2.2	10.2
Surgical Specialties	1.708	12.2	8.676	1.7	9.8
Other Specialties	1.875	14.8	7.303	5.1	9.0
Surgical Procedures	1.580	41.9	2.123	–20.7	5.8
General Practice	0.168	62.6	0.852	–41.5	12.8
Medical Specialties	0.495	54.4	0.928	–25.9	13.6
Surgical Specialties	0.652	17.4	3.739	–2.9	4.3
Other Specialties	0.265	66.0	1.183	–36.0	–1.0
Radiological Procedures	2.351	9.3	6.800	7.1	10.5
General Practice	0.076	4.9	4.259	2.1	9.0
Medical Specialties	0.145	6.9	6.717	16.4	3.8
Surgical Specialties	0.172	12.7	5.163	19.3	–16.0
Other Specialties	1.958	9.3	7.048	5.7	14.2
Laboratory Procedures	4.388	24.6	13.984	5.4	1.7
General Practice	0.601	8.3	9.004	13.0	1.0
Medical Specialties	1.021	12.0	10.492	11.1	1.0
Surgical Specialties	0.238	12.5	9.695	9.1	–5.6
Other Specialties	2.528	34.7	16.982	–0.1	2.2

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* RVUs for all services are medical RVUs. RVUs for medical, surgical, radiological, and laboratory procedures are their own procedure group's RVUs.

allowed charges per RVU of 13% (general practitioners) and 14% (medical specialists).

Radiological procedures (see Table 13) are performed almost entirely by other specialists: Only about 17% of the services are performed by general practitioners, medical specialists or surgical specialists. Radiological services performed by other specialties increased 9% in use, 6% in intensity and 14% in allowed charges per RVU.

Laboratory services are performed most often by other specialists (58%), followed by medical specialists and general practitioners (23% and 14% respectively) and finally by surgical specialists (5%). Other specialists have a dramatic increase in service use (35%), a small decrease in intensity (-0.1%) and a small increase in allowed charges per RVU (2%). Medical specialists and general practitioners have a more moderate increase in use (12% and 8% respectively), an increase in intensity (11% and 13% respectively) and a small price increase (1%). Surgical specialists have a moderate increase in use (13%) and intensity (9%) and a decrease in price (-6%).

By Assignment Status

Table 15 shows the percentage of allowed charges assigned by carrier in the three years 1986, 1987 and 1988. Also shown in the table is the number of crossover beneficiaries in that carrier area. The allowed charges assigned used for Tables 11 and 12 were estimated because data on allowed charges assigned do not appear in the procedure files. For each procedure code there exists an indication of the number of services assigned, total number of services and allowed charges. We used these data to estimate allowed charges. That is, for each procedure code, the assigned allowed charges were estimated based on the percentage of assigned services. Thus, for example, if 50% of the services were assigned procedure code 90050, then 50% of the allowed charges for that procedure code were assumed to be assigned.

Table 15

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
All Carriers	67.3	9.6	72.4	9.6	77.2	9.7
Alabama 00510 BC & BS of Alabama	75.7	19.4	83.6	17.2	87.9	16.6
Alaska 01020 Aetna Life & Casualty	59.3	17.9	69.2	19.1	75.9	19.5
Arkansas 00520 Arkansas BS	75.2	18.1	82.6	17.8	87.5	17.4
Arizona 01030 Aetna Life & Casualty	52.5	4.7	61.5	4.6	70.4	4.7
California 00542 California Physicians Service (d/b/a BS of California)	66.4	19.6	70.7	19.7	75.5	19.7
California 02050 TransAmerica Occidental Life	77.0	19.6	81.3	19.6	85.7	19.7
Colorado 00550 Rocky Mtn. Hospital & Medical Service (d/b/a BS of Colorado)	65.1	11.4	55.9	11.4	64.7	11.3

Table 15 (Continued)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 – 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
Connecticut 10230 Travelers Insurance Company	58.4	3.5	67.1	3.7	76.6	3.9
District of Columbia 00580 Pennsylvania BS	76.8	9.3	81.1	9.5	83.8	9.7
Delaware 00570 Pennsylvania BS	80.0	5.4	86.6	5.2	89.0	5.2
Florida 00590 BS of Florida	63.2	7.1	69.3	7.2	76.8	7.5
Georgia 13110/01040 The Prudential Insurance Co. of America Aetna Life & Casualty	58.0	18.8	62.3	18.5	77.1	18.2
Hawaii 01120 Aetna Life & Casualty	68.2	9.4	74.2	9.2	79.3	9.2
Iowa 00640 BS of Iowa	49.3	7.5	55.9	8.2	64.7	8.5
Idaho 05130 Equicor, Inc. -- Equitable Corporation	83.8	6.2	85.8	6.2	31.7	6.4

Table 15 (Continued)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
Illinois 00621 BS of Illinois	56.5	3.3	62.4	3.5	67.7	3.5
Indiana 00630 Associated Insurance Companies (d/b/a BC & BS of Indiana)	50.3	6.7	60.9	7.0	71.1	7.2
Kansas 00650 BS of Kansas	54.0	7.3	69.5	7.3	71.4	7.3
Kansas & Missouri 00740 BS of Kansas City	97.3	5.3	98.0	5.2	85.3	5.2
Kentucky 00660 BC & BS of Kentucky	96.2	12.6	97.3	12.6	77.7	12.4
Louisiana 00528 Arakansas BC & BS	61.0	16.5	71.1	16.1	80.8	15.7
Massachusetts 00700 BS of Massachusetts	96.5	9.5	98.1	9.2	98.8	9.1
Maryland 00690 BS of Maryland	70.5	9.8	72.9	9.9	80.2	9.9

Table 15 (Continued)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
Maine 21200 BS of Massachusetts	79.0	9.2	84.2	9.1	87.8	9.0
Michigan 00710 BC & BS of Michigan	81.8	6.1	78.1	6.1	78.7	6.1
Minnesota 00720 BC & BS of Minnesota	29.2	3.5	36.3	3.5	39.2	3.7
Minnesota 10240 The Travelers Insurance Company	53.8	2.8	63.5	2.9	66.1	3.1
Missouri 11260 General American Life	60.8	7.0	68.0	6.8	72.3	6.6
Mississippi 10250 The Travelers Insurance Company	69.2	26.0	75.5	25.6	81.3	24.7
Montana 00751 BS of Montana	39.8	8.0	45.9	8.1	49.4	8.4
N. Carolina 13340/05535 The Prudential Insurance Co. of America/ Equicor, Inc.--Equitable Corporation	60.3	8.6	67.1	9.0	78.7	9.4

Table 15 (Continued)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
N. Dakota & S. Dakota 00820 BS of North Dakota	24.4	4.7	33.6	4.7	39.7	4.9
Nebraska 00645/00655 BC of Iowa BS of Kansas	35.7	3.5	49.9	3.4	44.2	3.5
New Hampshire & Vermont 00780 BC & BS of Massachusetts	57.4	4.9	65.6	4.8	73.0	4.8
New Jersey 13310/00860 The Prudential Insurance Co. of America/ Pennsylvania BS	55.3	7.6	57.3	7.8	69.0	8.2
New Mexico 01360 Aetna Life & Casualty Company	59.4	12.7	64.0	12.9	72.0	13.1
Nevada 01290 Aetna Life & Casualty Company	83.4	6.1	87.1	5.8	91.6	5.7
New York 00801 BS of Western New York	70.3	6.1	75.3	6.2	80.5	6.3
New York 00803 Empire BC & BS	65.7	10.0	68.4	10.3	77.2	10.4

Table 15 (Continued)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
New York 14330 Group Health Incorporated	75.2	8.9	79.6	9.3	82.8	9.6
Ohio 16360 Nationwide Mutual Insurance Company	52.4	6.3	64.3	6.3	74.7	6.5
Oklahoma 01370 Aetna Life & Casualty Company	43.2	10.2	53.5	10.1	62.6	10.0
Oregon 01380 Aetna Life & Casualty Company	44.6	6.0	50.7	6.1	56.7	6.2
Pennsylvania 00865 Pennsylvania BS	87.4	5.1	90.5	5.1	92.5	5.1
Puerto Rico 00973 Seguros de Servicio de Salud de Puerto Rico	99.7	0.7	99.8	0.8	96.3	0.8
Rhode Island 00870 BS of Rhode Island	93.3	6.8	93.8	6.8	95.1	6.7
Railroad 10071 The Travelers Insurance Company	60.3	2.3	68.0	2.4	74.0	2.4
South Carolina 00880 BC & BS of South Carolina	77.1	17.6	78.4	17.2	79.3	16.8

Table 15 (Concluded)

PERCENTAGE OF ALLOWED CHARGES ASSIGNED AND PERCENTAGE OF MEDICARE PERSON-YEARS OF ELIGIBILITY ALSO ELIGIBLE FOR MEDICAID (CROSSOVERS), BY CARRIER, 1986 - 1988

	1986		1987		1988	
	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**	% Allowed $ Assigned*	% of Crossovers**
Tennessee 05440						
Equicor, Inc.--Equitable Corporation	98.4	13.4	98.7	13.1	77.4	12.9
Texas 00900						
Group Medical/Surgical Services	62.1	14.2	70.8	14.1	75.8	13.9
Utah 00910						
BS of Utah	61.2	5.8	69.7	5.8	76.3	5.8
Virginia 10490						
The Travelers Insurance Company	65.6	11.0	73.9	10.9	80.1	10.8
Washington 00930						
Washington Physician Service	44.2	8.3	51.3	8.4	56.4	8.6
Wisconsin 00951						
Wisconsin Physicians' Service Corporation	51.0	6.9	56.2	7.0	62.5	7.1
West Virginia 16510						
Nationwide Mutual Insurance Company	71.2	8.1	79.2	8.1	87.2	8.1
Wyoming 05530						
Equicor, Inc.--Equitable Corporation	81.9	0.3	83.8	0.3	36.9	0.4

* Assigned services divided by total services.

** Unadjusted person years of Medicaid eligibility divided by unadjusted person years of eligibility.

Overall, the allowed charge assigned percentage increases from 67% to 77% over the three-year period. The percentage of eligibles who are Medicaid eligible is stable nationally at around 10% across the three years. The assigned percentage of allowed charges ranges substantially by carrier from a low of 24% in North and South Dakota to a high of almost 100% in Puerto Rico in 1986. Other carriers with allowed charge assignment rates over 90% in 1986 were Tennessee, Kansas, Kentucky, Massachusetts, and Rhode Island. By 1988, assignment rates had risen to 77%, from a low of 32% in Idaho to a high of 99% in Massachusetts.

Massachusetts implemented mandatory Medicare assignment for all Medicare eligibles in February 1986. Other states that have legislation during our study period which requires physicians under certain circumstances to accept assignment as payment in full (and the month that legislation was implemented) are: Rhode Island (July 1987), Vermont (July 1987) and Connecticut (June 1987). The Rhode Island program requires assignment for all single beneficiaries with income less than or equal to $12,000 and all married beneficiaries with income less than or equal to $15,000 in 1987. The Vermont program has had higher income levels: $25,000 for single beneficiaries and $32,000 for married beneficiaries in 1987 and excluded coverage of physician home and office visits. Connecticut's 1987 income levels were $19,950 for single beneficiaries and $24,000 for married beneficiaries. Besides the mandatory programs it should be noted that 26 states have voluntary statewide or county programs as of June 1989.[25]

In general, most states had increases in their assignment rates along the same lines as the average national increase. Data for some states, however, seem suspicious and we are unable to explain them. In particular two states (Idaho, Wyoming) have high levels of assignment in 1986 with a dramatic decrease in 1988. Three other carrier areas (Kansas/Missouri, Kentucky and Tennessee) have very high rates of assignment in 1986 with a decrease in 1988. Based on percent of assigned charges data from BPO carrier workload reports for the study period, we are suspicious that these five carriers miscoded the assignment field in the procedure file for 1986 and 1987. The 1988 data in

BMAD are much more consistent with the workload reports than the two previous years.

The percentage of Medicare eligibles with Medicaid coverage indicated in the HCFA eligibility files also ranged greatly by carrier. The mean is 10% but numbers range from less than 1% in Wyoming to 26% in Mississippi in 1986 and from less than 1% in Wyoming to 25% in Mississippi in 1988.

The magnitude of crossover activity is reported in Table 15 because assignment rates are affected by the amount of crossover activity, since Medicaid claims must be assigned. An examination of the voluntary assignment rates must take account of the level of crossover activity in a particular carrier area. For example, at least nine carriers had crossover volumes exceeding 15% (Alabama, Alaska, Arkansas, both in California, Georgia, Louisiana, Mississippi, South Carolina) which could impact the assignment rate. On the other hand, Delaware, Kansas/Missouri, Nevada and Puerto Rico reflect assignment rates well above average, despite crossover activity of 5% or less. The national laboratory processing aspect of Delaware's operation might account for that carrier's rates.

Table 16 shows assignment rate by procedure group, place of service and specialty. By procedure group, the rate was consistently higher for laboratory services, especially in 1987 and 1988 after the mandatory assignment of laboratory services was implemented. Assignment of medical services increased from 65% to 74%, surgical services from 67% to 78%, radiology from 70% to 77% and laboratory from 79% to 94%. These increases are also likely impacted by the participating physician program.

The assignment rates are lowest for office services (59% to 71%) followed by inpatient hospital services (67% to 77%), outpatient hospital services (74% to 82%) and other places of services (92% to 95%).

By specialty, general practitioners are least likely to provide services on assignment (60% to 72%), followed by medical specialists (65% to 76%), surgical specialists (66% to 77%) and other specialties (75% to 81%).

Table 16

PERCENTAGE OF ALLOWED CHARGES ASSIGNED BY PROCEDURE CODE, PLACE OF SERVICE, AND SPECIALTY, 1986 – 1988

	1986	1987	1988
Procedure Group			
Medical	65.1	68.9	74.3
Surgical	66.7	72.4	77.5
Radiology	70.4	74.1	77.2
Laboratory	79.1	92.5	94.1
Place of Service			
Office	58.8	66.0	70.7
Inpatient Hospital	67.2	71.2	77.3
Outpatient Hospital	74.3	78.7	82.1
Other	91.9	93.9	94.6
Specialty			
General Practice	59.9	66.2	71.6
Medical Specialties	65.1	70.3	75.7
Surgical Specialties	65.5	71.8	77.2
Other	75.1	78.1	80.8

Investigations of Special Procedure Groups

Below we discuss further investigations of selected procedure groups. These special investigations were devised to highlight areas of HCFA special interest. These areas are: detailed procedure groupings, surgery related services; upgrading of coding for routine office visits, routine hospital visits and consultations; families of procedures; and selected laboratory tests. With the exception of the upgrading of coding tables, these tables are laid out in an identical manner as Tables 13 and 14 above.

Detailed Procedure Groupings

Table 17 shows the procedure codes broken down into detail groupings. There are 34 medical groupings, 17 surgery groupings, 3 radiology groupings, and 9 laboratory groupings. Technical Memo #10 specifies how these groupings are defined. What is interesting is the variation in the changes in use, intensity, and price (allowed charges/RVU) observed in the data. For medical procedures, the new patient office visits increased 5% in use, 1% in intensity and 16% in price, while established patient office visits have increased at a much faster rate (10%), with intensity increasing 2% and price 10%. Hospital visits also show a different pattern for initial and subsequent visits with subsequent hospital visits increasing 6%, their intensity increasing 3% and 8% in price. Initial hospital visits on the other hand decreased 5% in use, intensity 1%, and 12% in price.

Among the medical service groups increasing a great deal are second opinions (+134%), telephone calls (+67%), administration/other service (+50%), allergy services (+36%) and pulmonary (+32%). Increases over 20% were also found for neurology, special physician visits, dermatology and supplies. Large decreases in number of services per eligible were found for specimen collection, general medicine, and preventative medicine. Despite their appearance in these tables it should be noted that preventive medical procedures are not services covered by the Medicare program. Intensity changes were found to be 3% on average for all medical procedures. Procedure

Table 17

GROWTH IN SERVICES PER ELIGIBLE, RVUs PER SERVICE, AND ALLOWED CHARGES PER RVU, BY DETAILED PROCEDURE GROUPS, 1986-1988

	# of Services/Eligible		#RVUs/Service		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
All Procedures	19.049	15.6	10.4	-1.0	7.9
Medical Procedures	10.730	9.4	7.9	2.7	10.5
Office Visit, New Patient	0.289	4.6	11.9	1.2	15.6
Office Visit, Established Patient	3.590	9.5	5.9	2.3	9.6
Home Visit, New Patient	0.005	-0.6	10.2	3.4	13.2
Home Visit, Established Patient	0.055	-12.5	7.4	1.1	15.3
Hospital Visit, Initial	0.285	-5.4	17.2	1.0	12.3
Hospital Visit, Subsequent	2.389	5.8	6.1	2.9	8.4
Nursing Home Visit, Initial	0.028	5.3	12.8	2.8	11.4
Nursing Home Visit, Subsequent	0.365	6.1	8.1	1.8	11.1
Emergency Visit, New Patient	0.212	14.4	10.8	6.3	16.8
Emergency Visit, Established Patient	0.062	0.9	7.2	2.7	12.8
Consultations	0.393	9.8	17.3	3.1	9.8
Second Opinions	0.001	134.2	14.6	7.0	9.8
General Medical	0.005	-46.1	5.9	0.0	25.4
Immunizations & Injections	0.013	3.8	2.8	6.5	-4.5
Preventive Medicine	0.000	-35.5	5.8	6.6	1.9
Injections	0.024	8.7	1.5	1.2	-13.9
Mental Health	0.196	18.3	9.5	11.6	11.6
Dialysis	0.145	-15.5	13.2	13.3	-7.5
Gastroenterology	0.001	-29.9	20.6	-2.5	68.0
Opthalmology	0.404	36.5	11.2	0.3	7.2
Special Otorhinolaryngologic	0.046	18.6	8.0	-1.4	9.0
Cardiovascular	0.997	7.0	8.7	-3.9	18.5
Pulmonary	0.183	32.1	23.6	2.2	10.2
Allergy	0.100	35.9	1.6	0.5	-0.5
Neurology	0.063	25.0	16.1	-7.8	16.8

Table 17 (Continued)

GROWTH IN SERVICES PER ELIGIBLE, RVUs PER SERVICE, AND ALLOWED CHARGES PER RVU, BY DETAILED PROCEDURE GROUPS, 1986–1988

	# of Services/Eligible		#RVUs/Service		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
Chemotherapy Injections	0.048	13.2	8.0	3.7	12.3
Dermatology	0.007	24.1	3.5	7.8	1.4
Physical Medicine & Chiropractor	0.467	16.2	1.9	4.1	5.0
Specimen Collection	0.082	-61.5	0.9	14.0	18.5
Telephone Calls	0.001	67.1	1.3	-15.5	-13.0
Special Physician Visits	0.231	24.2	12.3	-2.1	13.0
Supplies	0.029	20.7	3.0	0.2	5.3
Administrative/Other	0.003	50.2	1.0	-32.2	8.7
Special Services	0.010	-25.4	9.3	8.5	-14.4
Surgery Procedures	1.580	41.9	2.1	-20.7	5.8
Integumentary	0.513	21.4	0.6	-7.8	10.0
Musculoskeletal	0.162	14.1	3.0	-2.8	5.4
Respiratory	0.036	9.2	2.6	-1.5	8.7
Cardiovascular/Vascular	0.470	102.9	1.1	-44.5	8.5
Hemic/Lymphatic	0.002	1.2	5.8	1.6	7.6
Mediastinum/Diaphragm	0.001	-3.1	6.6	1.4	6.5
Digestive	0.154	9.3	4.1	-0.1	9.8
Urinary	0.086	8.7	2.5	-7.0	10.2
Male Reproductive	0.007	27.0	4.7	-8.3	13.6
Female Reproductive	0.012	14.6	4.4	-6.1	7.7
Maternity	0.000	19.9	4.4	-15.3	20.6
Endocrine	0.001	3.6	8.0	-0.7	6.1
Nervous	0.023	26.4	4.1	-6.8	6.6
Eye	0.078	24.9	11.0	-2.9	-1.5
Ear	0.016	28.7	0.9	-19.5	9.8
HCPCS Level II, "T" Codes	0.019	-63.7	1.0	-28.6	13.7
Anesthesia	0.000	4351.9	6.3	-12.6	-29.6

Table 17 (Concluded)

GROWTH IN SERVICES PER ELIGIBLE, RVUs PER SERVICE, AND ALLOWED CHARGES PER RVU, BY DETAILED PROCEDURE GROUPS, 1986–1988

	# of Services/Eligible		#RVUs/Service		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
Radiology Procedures	2.351	9.3	6.8	7.1	10.5
HCPCS Level II "R" Codes	0.023	6.2	3.8	–7.2	28.9
Diagnostic	2.125	10.0	6.9	6.7	10.0
Therapeutic	0.203	1.8	5.8	11.7	15.4
Laboratory Procedures	4.388	24.6	14.0	5.4	1.7
HCPCS Level II "P" Codes	0.153	74.8	5.4	–39.9	–9.2
Automated Tests	0.676	26.4	24.1	3.2	8.4
Urinalysis	0.589	5.4	5.8	–1.0	–6.0
Chemistry/Toxicology	1.241	35.5	12.9	9.8	–1.6
Hematology	1.051	16.9	8.9	8.4	–2.2
Immunology	0.122	31.5	22.6	19.5	–11.5
Microbiology	0.228	28.6	14.2	0.1	–6.0
Pathology	0.302	13.1	29.8	2.0	17.6
Miscellaneous	0.024	–31.7	16.3	–19.0	11.0

groups with the biggest changes in intensity were specimen collection, dialysis and mental health. Price increases were highest for gastroenterology services (+68%), general medical visits (+25%), cardiovascular services (+19%), specimen collection (+19%), and neurology services (+17%).

For surgical procedures, considerable variation is also shown by body system. One system stands out: cardiovascular/vascular which shows a 103% increase in use per eligible. It should be noted that this range of procedure numbers include routine venipuncture for collection of specimen(s), the most common surgical procedure (over 25 million services in 1988) and one which has experienced a 126% increase in use over the three year period. This is consistent with the data reported in Table 17 which show a dramatic decrease (-45%) in intensity. Other areas of increase in use are surgeries of the ear (+29%), male reproduction system (+27%), nervous system (+26%) and eye (+25%).

Radiological procedures' increased use is more pronounced for diagnostic than therapeutic (10% versus 2%) although the therapeutic procedures have a larger percent increase in intensity and in price.

Laboratory procedures use increases most quickly for chemistry/toxicology tests, immunology, microbiology and automated tests. Intensity changes were greatest for immunology tests (+20%). Allowed charges per RVU decreased for all laboratory procedures except automated tests (+8%) and pathology (+18%).

Surgery Related Procedures

Table 18 presents data on surgical related procedures. These include assistants at surgery, surgical procedures where the type of service code is equal to surgery (TOS = 2), surgical procedures where the type of service is not equal to surgery (TOS not equal to 2), consultation by surgeons, anesthesia services not provided by Certified Nurse Anesthetists (CRNAs), and anesthesia services provided by CRNAs. Technical Memo #6 outlines the detailed definitions for these services.

Table 18

GROWTH IN SURGICAL RELATED SERVICES, SURGICAL PROCEDURES, CONSULTATIONS, AND ANESTHESIA SERVICES, 1986–1988

Detailed Procedure Group	# of Services/Eligible 1986	# of Services/Eligible % Change	# RVUs/Service 1986	# RVUs/Service % Change	% Change In Allowed $/RVU
Total All Surgery Related Services	2.718	27.0	N/A	N/A	N/A
Surgical Procedures					
Assistants at Surgery	0.037	0.9	12.7	2.5	0.4
Surgical Procedures Not Assistants with TOS = 2	1.209	15.6	2.3	–2.2	5.0
Surgical Procedures Not Assistants, TOS not equal to 2	0.333	141.9	0.3	–41.3	28.7
Consultations by Surgeons	0.107	11.7	17.2	0.6	9.2
Anesthesia Services					
Anesthesia, not CRNA	1.030	5.7	N/A	N/A	N/A
Anesthesia, CRNA	0.000 *	0	N/A	N/A	N/A

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* Only 7 services identified as CRNA services appeared in our tables.
N/A = Not Applicable, Anesthesia services did not have RVUs.

Assistants at surgery have low use relative to the number of surgical procedures reported. This may indicate the magnitude of the assistant at surgery usage is small, it may reflect the usage of residents and interns as assistants (these physicians cannot bill separately for their services), or it may indicate that assistant surgery procedures are often miscoded. There was considerable evidence of this in our analysis of field distributions, where we found considerable inconsistency between services with the type of service equals assistant surgery and services with assistant at surgery modifiers. The former were almost double the latter although their numbers should be identical.

Table 18 also indicates inconsistency between procedures codes used and type of service code. It appears that as many as 20% of services having surgical procedure codes do not have a type of surgery equal to surgery (TOS = 2). In other words, a surgical procedure code in the CPT range 10000 to 69999 was billed with the incorrect type of service code. To some extent this difference may be understandable because there are surgical procedures such as venipuncture for the collection of specimen(s) which are not strictly speaking surgical services although these services do have a surgical procedure number. Non-surgeon physicians who bill for these services may routinely code them as a medical TOS. What is interesting in examining Table 18 is that the surgical procedure codes with type of service not equal to surgery have exhibited a much larger increase than the surgical procedures when type of service equals surgery (142% as compared to 16%). This is consistent with the appearance of venipuncture as the most frequently performed surgical procedure. Note also they have experienced a larger decrease in intensity than the surgical services where type of service equals surgery (-2% versus -41%).

Consultations by surgeons have increased 12% per eligible, 0.6% in intensity and 9% in price. These consultations were identified by selecting all CPT consultation codes and second opinion codes billed by surgical specialties, plus procedure codes with second or third surgical opinion modifiers and/or type of service (see Technical Issues Memo #6). Anesthesia services are an area of substantial problems in uniform coding during our study period. Anesthesia services are only rarely billed as being performed by CRNAs. Only 7 services identified as CRNA services were found in the data presented in Table 18 in 1987. RVUs for anesthesia services are not available, consequently we were unable to calculate changes in RVUs per service or allowed charges per RVU. Overall, anesthesia services per eligible increased 6%. The rates of their use reported here seem consistent with the surgery rates. In 1986, the anesthesia rate was 85% of the rate of surgical procedures with type of service equals surgery (TOS equals 2). In 1987, the anesthesia rate was 87% of surgical procedures with TOS equals 2, and in 1988 it was 78%.

Upgrading of Service Coding

There is considerable interest in investigating the extent that upgrading of service coding may play in increasing total cost. One way to examine this is to disaggregate the total price increase into that due to price as compared to that due to the pattern of charges. The method used here is based on the one used by William J. Sobaski, Anne A. Scitovsky and Nelda McCall in a 1976 publication.[26] This methodology disaggregates the total cost increase for a particular group of services into that due to price and that due to the pattern of charges.

Table 19 shows the results for office visits, Table 20 for hospital visits and Table 21 for consultations. As can be seen in those tables for office visits, 1.5% of the 12.5% increase is due to the pattern of charges. For hospital visits, 0.3% of the 4.1% increase is due to the pattern of charges. For consultations, 2.8% of the 13.2% increase is due to the pattern of charges. The table below summarizes the results for each of the three types of services.

Table 19

ANALYSIS OF UPGRADING OF OFFICE VISITS

					Cost of specific service per 1,000 office visits			Indices of Change (1986 = 100)		
					Actual		Simulated	Total Cost	Price	Pattern
Procedure Codes	1986 Percentage Distribution of Services (Qo)	1986 Average Allowed Charge Per Office Visit (Po)	1988 Percentage Distribution of Services (Q1)	1988 Average Allowed Charge Per Office Visit (P1)	QoPo	Q1P1	QoP1	Q1P1/QoPo	QoP1/QoPo	Q1P1/QoP1
90000	0.7	21.30	0.5	24.29	142.24	121.83	162.18	85.7	114.0	75.1
90010	1.4	26.24	1.3	29.76	378.78	386.91	429.57	102.1	113.4	90.1
90015	2.1	31.42	2.0	35.32	656.02	720.33	737.32	109.8	112.4	97.7
90017	0.6	33.95	0.7	40.26	214.74	300.70	254.65	140.0	118.6	118.1
90020	2.6	49.47	2.6	58.14	1,301.08	1,489.39	1,528.93	114.5	117.5	97.4
90030	1.9	12.25	1.7	11.74	228.30	203.25	218.72	89.0	95.8	92.9
90040	12.5	15.88	9.8	17.41	1,991.03	1,698.06	2,183.17	85.3	109.7	77.8
90050	35.5	18.96	35.0	20.83	6,722.01	7,283.91	7,385.10	108.4	109.9	98.6
90060	32.8	23.83	35.5	26.14	7,815.32	9,270.89	8,575.56	118.6	109.7	108.1
90070	6.6	30.06	7.5	34.05	1,987.25	2,557.58	2,251.28	128.7	113.3	113.6
90080	3.3	44.31	3.4	49.78	1,446.79	1,702.77	1,625.20	117.7	112.3	104.8
Cost per 1,000 Medicare office visits					22,883.56	25,735.62	25,351.68	112.5	110.8	101.5
Average cost per office visit					22.88	25.74	25.35	(12.5)	(10.8)	(1.5)

Table 20

ANALYSIS OF UPGRADING OF HOSPITAL VISITS

	1986 Percentage Distribution of Services (Qo)	1986 Average Allowed Charge Per Office Visit (Po)	1988 Percentage Distribution of Services (Q1)	1988 Average Allowed Charge Per Office Visit (P1)	Cost of specific service per 1,000 office visits			Indices of Change (1986 = 100)		
					Actual		Simulated	Total Cost	Price	Pattern
					QoPo	Q1P1	QoP1	Q1P1 / QoPo	QoP1 / QoPo	Q1P1 / QoP1
Procedure Codes										
90200	0.9	43.68	0.6	47.06	377.92	281.76	407.19	74.6	107.7	69.2
90215	2.5	55.53	2.2	61.56	1,403.34	1,351.40	1,555.88	96.3	110.9	86.9
90220	7.4	69.62	7.0	78.69	5,177.77	5,500.79	5,852.67	106.2	113.0	94.0
90240	11.7	19.46	8.9	20.49	2,283.11	1,828.18	2,403.91	80.1	105.3	76.1
90250	30.6	23.47	28.1	25.93	7,188.22	7,294.92	7,940.88	101.5	110.5	91.9
90260	33.2	28.35	37.4	30.39	9,420.32	11,379.47	10,099.92	120.8	107.2	112.7
90270	7.8	48.23	8.8	29.42	3,768.92	2,600.51	2,298.74	69.0	61.0	113.1
90280	2.9	38.59	3.1	42.72	1,137.42	1,340.62	1,259.16	117.9	110.7	106.5
90292	2.8	30.71	3.7	35.84	866.55	1,340.90	1,011.38	154.7	116.7	132.6
Cost per 1,000 Medicare office visits					31,623.56	32,918.56	32,829.74	104.1	103.8	100.3
Average cost per office visit					31.62	32.92	32.83	(4.1)	(3.8)	(0.3)

Table 21

ANALYSIS OF UPGRADING OF CONSULTATIONS

	1986 Percentage Distribution of Services (Qo)	1986 Average Allowed Charge Per Office Visit (Po)	1988 Percentage Distribution of Services (Q1)	1988 Average Allowed Charge Per Office Visit (P1)	Cost of specific service per 1,000 office visits			Indices of Change (1986 = 100)		
					Actual		Simulated	Total Cost	Price	Pattern
					QoPo	Q1P1	QoP1	$\frac{Q1P1}{QoPo}$	$\frac{QoP1}{QoPo}$	$\frac{Q1P1}{QoP1}$
Procedure Codes										
90600	9.9	52.53	8.3	55.06	5,181.91	4,580.52	5,431.13	88.4	104.8	84.3
90605	6.6	50.21	7.5	54.46	3,318.64	4,076.29	3,600.05	122.8	108.5	113.2
90610	9.3	63.01	9.1	69.46	5,876.47	6,302.01	6,478.33	107.2	110.2	97.3
90620	42.0	85.48	43.9	94.14	35,935.76	41,298.21	39,573.98	114.9	110.1	104.4
90630	9.3	109.61	10.8	121.96	10,139.04	13,120.52	11,281.16	129.4	111.3	116.3
90640	2.8	21.99	2.2	24.38	608.30	536.37	674.43	88.2	110.9	79.5
90641	4.7	26.40	4.8	28.38	1,246.00	1,369.29	1,339.44	109.9	107.5	102.2
90642	10.8	32.58	9.3	38.81	3,522.42	3,621.52	4,195.79	102.8	119.1	86.3
90643	4.6	48.54	4.1	52.40	2,240.32	2,169.71	2,418.56	96.8	108.0	89.7
Cost per 1,000 Medicare office visits					68,068.87	77,074.43	74,992.87	113.2	110.2	102.8
Average cost per office visit					68.07	77.07	74.99	(13.2)	(10.2)	(2.8)

	% of Total Cost Increase Accounted for by Pattern of Charges
Office Visits	12
Hospital Visits	7
Consultations	21

While these numbers may seem small relative to the increase due to price, it should be remembered that given the frequency of use of these codes, they can account for a large increase in overall cost to the program. The pattern of charges increase in office visits is $43.5 million from 1986 to 1988; the pattern of charges increase in hospital visits is $7.0 million; and the pattern of charges increase for consultations is $24.2 million. In total, upgrading in these three types of services accounted for $74.7 million in additional Medicare expenditures from 1986 to 1988.

It should also be noted that these increases are ones which are being measured over a very short timeframe -- only a three-year period. Further, they represent a potential for cost increase which is not currently able to be directly controlled by the Medicare program.

Families of Procedures

These families of procedures were developed from lists provided to us by HCFA and represent procedures whose relative values were determined to be overvalued by the Prospective Payment Review Commission (PPRC) from a comparison of national average prevailing charges and the amounts that Medicare would pay physicians based on a resource-based relative value scale.[27] Reductions in fees will take affect April 1, 1990. Selected procedures were expanded to include all like procedures within the same range of codes. Procedures with very low volume and/or allowed charges were deleted.

In general, we found a 10% increase in use among these services (Table 22), a 3% increase in intensity and a 5% increase in price. It should be

Table 22

GROWTH IN NUMBER OF SERVICES PER ELIGIBLE, RVUs PER SERVICE, AND ALLOWED CHARGES PER RVU, FOR SELECTED FAMILIES OF PROCEDURES, 1986 – 1988

	# of Services/Eligible		# RVUs/Service		% Change In
Family of Procedures	1986	% Change	1986	% Change	Allowed $/RVU
All	1.1698	10.3	38.96	3.0	4.7
Breast Surgery	0.0062	23.3	6.16	-4.2	10.3
Hip Surgery	0.0046	16.1	23.48	-1.5	2.9
Bunion Correction	0.0022	-2.3	5.26	1.0	11.7
Knee/Arthroscopy/Surgery	0.0016	40.7	8.87	8.2	6.4
Lung Removal	0.0011	3.5	15.28	-0.5	6.7
Pacemaker Surgery	0.0065	-6.8	7.58	3.7	7.3
Coronary Artery Bypass	0.0056	23.1	26.47	0.2	3.7
Artery Repair	0.0021	3.0	17.79	0.0	7.9
Rechanneling of Artery	0.0036	-6.1	14.08	-0.3	7.8
Colon/Intestine Surgery	0.0077	0.4	12.39	0.2	7.7
Colonoscopy	0.0296	-3.9	4.70	16.9	12.4
Removal of Gallbladder	0.0076	0.8	9.23	0.4	7.8
Hernia Repair	0.0087	5.3	5.97	0.0	7.7
Transurethral Surgery	0.0089	-0.9	10.91	1.1	4.4
Hysterectomy	0.0028	0.8	10.39	0.2	8.0
Disk Surgery	0.0025	31.0	12.73	-4.6	7.0
Nerve Revision	0.0020	17.6	5.15	-0.5	5.2
Cataract Surgery	0.0479	24.4	14.23	-3.1	-3.4
Treatment of Retinal Lesion	0.0046	35.1	8.98	0.7	7.3
Echo Exam of Abdomen	0.0549	17.7	11.25	-0.7	14.3
Opthalmoscopy/Angioscopy	0.0409	59.2	11.83	-7.9	4.3
ECG/Stress Tests	0.9099	7.5	6.01	-1.9	16.9
Heart Catheterization	0.0083	11.5	71.26	-2.3	8.4

remembered that these procedures are ones which have been identified as having relative values that are overvalued and not ones which necessarily have increased rapidly in use, intensity or price. Despite this, several of these families have experienced considerable increases in use over the period 1986-1988. Perhaps the most important because of their relatively larger utilization rates are ophthalmoscopy/angioscopy (+59%), cataract surgery (+24%), and echo exam of the abdomen (+18%). It should be noted that ophthalmoscopy/angioscopy procedures have become less intensive (-8%) but their allowed charges/RVU have increased 4%. Cataract exams have become slightly less intensive (-3%) and experienced a decrease in allowed charges per RVU (-3%). Echo exams of the abdomen have decreased slightly in intensity (-7%), but increased 14% in price. Other families of procedures which have had substantial increases in services per Medicare eligible are knee/arthroscopy surgery (+41%), treatment of retinal lesion (+35%), disc surgery (+31%), coronary artery bypass (+23%) and breast surgery (+23%). Colonoscopy showed the biggest changes in intensity of the families, +17%. The allowed charge per RVU increase was greatest for ECG/stress tests (+17%) which is of special importance because it was the most common of all the procedures studied. Also showing strong price increases were echo exam of the abdomen (14%), colonoscopy (12%), and breast surgery (+10%). Detailed analysis of some of these price increases would require listing of the data for individual codes within the families. This more detailed analysis should take account of both procedure codes and modifiers because it should be remembered that modifiers were ignored in assigning RVUs to procedure codes.

Selected Laboratory Tests

Table 23 shows the growth in number of services, intensity of service use and price for selected laboratory tests from 1986 to 1988. These tests were provided in an article by Edward Zalta, M.D.[28] and determined to be "profitable tests". General criteria for selection of these tests was not clear, nor was it clear why specific certain tests were selected and others not. For example, Chemistry panel 15 and Chemistry panel 24 were selected but Chemistry panel 18 was not. The idea of the article was that these 20 tests

Table 23

GROWTH IN NUMBER OF SERVICES PER ELIGIBLE, RVUs PER SERVICE, AND ALLOWED CHARGES PER RVU, FOR SELECTED LABORATORY TESTS, 1986 - 1988

	# of Services/Eligible		# RVUs/Service		% Change In
	1986	% Change	1986	% Change	Allowed $/RVU
Laboratory Tests					
All	1.3948	6.6	3.09	8.4	0.2
Thromboplastin Time, Plasma	0.0086	60.1	10.00	0.0	-1.2
Arthritis Panel	0.0025	-21.3	28.61	0.0	83.3
Bilirubin, Blood, Total	0.0021	-21.4	8.00	0.0	3.2
Blood Grouping	0.0002	17.4	7.00	0.0	6.3
Urea Nitrogen, Blood (BUN)	0.0254	1.6	7.00	0.0	-5.9
Hemogram (CBC)	0.2104	-26.5	10.00	0.0	-4.0
Chemical Profile, 13-16	0.0350	20.0	30.00	0.0	-7.1
Chemical Profile, 19 or More	0.3564	16.7	23.53	0.0	6.1
Cardiac Evaluation Panel	0.0022	502.0	42.54	0.0	56.5
Culture; Throat or Nose	0.0077	-3.6	18.00	0.0	1.4
Electrolyte Panel, 4 Tests	0.0351	4.7	20.00	0.0	-12.6
Febrile Agglutinins Panel	0.0001	4.7	30.00	0.0	-11.7
Tolerance Test (GTT), 3 Specimens	0.0025	-7.3	25.00	0.0	6.3
Tolerance Test (GTT), 4+ Specimens	0.0019	-1.9	7.00	0.0	-3.4
Glucose, Urine	0.0028	14.2	10.00	0.0	-6.7
Lipid Profile	0.0052	435.0	32.67	0.0	21.7
Platelet Count (Rees-Ecker)	0.0550	6.9	8.00	0.0	-7.2
Prothrombin Time	0.1195	16.4	7.00	0.0	-4.5
Thyroid Panel	0.0174	54.2	25.78	0.0	22.0
Routine Urinalysis	0.5048	1.7	6.00	0.0	-5.8

were commonly performed in physicians' offices, but their administration had gradually become more and more automated, thus reducing physician costs to perform them. The article proposed that insurance fees had not been adjusted downward to reflect these decreased costs, thus providing a higher "profit margin" for the physician. For more detail, see Technical Memorandum #7.

The Medicare data for these 20 selected tests for 1988 show that the percent change in price between 1986 and 1988 rose for nine of the tests, and declined for the other eleven (see Table 23). Four of these tests show a substantial increase in price. These are arthritis panel (+83%), cardiac evaluation panel (+57%), thyroid panel (+22%), and lipid profile (+22%). Other than the arthritis panel, the three other panels are also those whose use was increasing most rapidly. Use of the cardiac evaluation panel increased 502% the thyroid panel 54% and the lipid profile 435%. The relative level of their use in 1988 was surprisingly high given that they involve multiple tests which should not be considered screening tests.

The Most Commonly Occurring and Most Costly Procedures

This section analyzes the growth of the procedures codes accounting for the largest number of services and largest amount of allowed charges for 1986-1988. The analysis is conducted separately for each of the procedure groups: medical, surgical, radiology and laboratory.

Medical Procedures

Table 24 lists the 20 most commonly coded medical procedures and Table 25 shows the 20 medical procedures accounting for the largest percentage of allowed charges. Also shown in each of the tables are their rank, percent of total services or allowed charges accounted for, the code and its explanation, the actual number of services or allowed charges in each year and its growth over the three-year period.

Table 24

20 MEDICAL PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986–1988

Rank	% of 1988 Medical Services	Code #	Explanation of Code	# of Services (In Thousands) 1986	1987	1988	% increase 1986–88
1	12.8	90060	Office Medical Service, Established Patient Intermediate Service	36,743	41,962	44,513	21.1
2	12.6	90050	Office Medical Service, Established Patient Limited Service	39,720	42,416	43,901	10.5
3	8.8	90260	Subsequent Hospital Care, Each Day; Requiring Intermediate Services	25,361	29,814	30,692	21.0
4	6.6	90250	Subsequent Hospital Care, Each Day; Requiring Limited Services	23,370	23,514	23,060	-1.3
5	4.8	93010	Electrocardiogram; Interpretation and Report Only	14,508	16,512	16,802	15.8
6	3.5	90040	Office Medical Service, Established Patient Brief Service	14,045	13,124	12,242	-12.8
7	2.7	93000	Electrocardiogram, With Interpretation and Report	9,457	9,614	9,559	1.1
8	2.7	90070	Office Medical Service, Established Patient Extended Service	7,406	8,632	9,429	27.3
9	2.5	A2000	Manipulation of Spine by Chiropractor	7,566	8,475	8,583	13.5
10	2.1	90240	Subsequent Hospital Care, Each Day; Requiring Brief Services	8,951	8,084	7,312	-18.3
11	2.1	90270	Subsequent Hospital Care, Each Day; Requiring Extended Services	5,963	6,954	7,246	21.5
12	1.6	90220	Initial Hospital Care; Comprehensive History and Examination, Initiation of Diagnostic and Treatment Programs, and Preparation of Hospital Records	5,675	5,685	5,729	1.0
13	1.6	90620	Initial Consultation; Comprehensive	4,788	5,348	5,628	17.6
14	1.3	92014	General Ophthalmological Services, Established Patient; Comprehensive, One or More Visits	3,142	4,077	4,517	43.8

Table 24 (Concluded)

20 MEDICAL PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986–1988

Rank	% of 1988 Medical Services	Code #	Explanation of Code	# of Services (In Thousands)			% increase 1986–88
				1986	1987	1988	
15	1.3	92012	General Ophthalmological Services, Established Patient; Medical Examination & Evaluation, With Initiation or Continuation of Diagnostic & Treatment Program, Intermediate	3,268	4,020	4,513	38.1
16	1.2	90080	Office Medical Service, Established Patient Comprehensive Service	3,657	3,992	4,294	17.4
17	0.9	90020	Office Medical Service, New Patient Comprehensive Service	2,946	3,093	3,216	9.2
18	0.9	90292	Hospital Discharge Day Management	2,153	2,625	3,066	42.4
19	0.7	90280	Subsequent Hospital Care, Each Day; Requiring Comprehensive Services	2,249	2,515	2,572	14.4
20	0.7	90015	Office Medical Service, New Patient Intermediate Service	2,339	2,440	2,560	9.5

Table 25

20 MEDICAL PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Medical Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands)			% increase
				1986	1987	1988	1986–88
1	9.9	90060	Office Medical Service, Established Patient Intermediate Service	875,453	1,072,046	1,163,763	32.9
2	8.0	90260	Subsequent Hospital Care, Each Day; Requiring Intermediate Services	718,868	880,135	932,737	29.8
3	7.8	90050	Office Medical Service, Established Patient Limited Service	752,983	862,757	914,339	21.4
4	5.1	90250	Subsequent Hospital Care, Each Day; Requiring Limited Services	548,535	604,371	597,940	9.0
5	4.5	90620	Initial Consultation; Comprehensive	409,257	493,395	529,837	29.5
6	3.8	90220	Initial Hospital Care; Comprehensive History and Examination, Initiation of Diagnostic and Treatment Programs, and Preparation of Hospital Records	395,117	438,172	450,881	14.1
7	2.9	93000	Electrocardiogram, With Interpretation and Report	286,051	330,408	336,686	17.7
8	2.7	90070	Office Medical Service, Established Patient Extended Service	222,607	283,742	321,049	44.2
9	2.5	90270	Subsequent Hospital Care, Each Day; Requiring Extended Services	211,242	269,813	287,608	36.2
10	1.9	93010	Electrocardiogram; Interpretation and Report Only	166,919	205,148	217,860	30.5
11	1.8	90080	Office Medical Service, Established Patient Comprehensive Service	162,066	191,082	213,746	31.9
12	1.8	90040	Office Medical Service, Established Patient Brief Service	223,030	223,512	213,155	–4.4
13	1.6	90020	Office Medical Service, New Patient Comprehensive Service	145,743	173,256	186,961	28.3
14	1.5	92014	General Ophthalmological Services, Established Patient; Comprehensive, One or More Visits	121,211	161,903	181,029	49.4

Table 25 (Concluded)

20 MEDICAL PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Medical Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	Allowed $ (In Thousands) 1987	Allowed $ (In Thousands) 1988	% increase 1986–88
15	1.4	90630	Initial Consultation; Complex	115,469	149,800	168,330	45.8
16	1.4	93547	Combined Left Heart Catheterization, Selective Coronary Angiography and Selective Left Ventricular Angiography	103,389	140,692	164,661	59.3
17	1.3	90240	Subsequent Hospital Care, Each Day; Requiring Brief Services	174,224	162,286	149,850	–14.0
18	1.2	A2000	Manipulation of Spine by Chiropractor	113,435	137,434	141,964	25.1
19	1.2	92012	General Ophthalmological Services, Established Patient; Medical Examination & Evaluation, With Initiation or Continuation of Diagnostic & Treatment Program, Intermediate	92,062	120,214	140,556	52.7
20	1.1	93309	Echocardiography, M–Mode and Real Time With Image Documentation	51,442	66,116	125,812	144.6

In general, there is a good deal of consistency between the two tables. The top procedures in terms of services and dollars are reasonably consistent. The first four procedures on both lists, the two most common office charges (90060 and 90050) and the two most common hospital charges (90260 and 90250) account for 41% of the medical services and 31% of the medical allowed charges. Three of the procedures (90060,90026,90050) have increased their allowed charges more than 20% from 1986-88. Allowed charges for 90250 have increased 9%.

The same two electrocardiogram services appear on both lists in positions 5 and 7 in the number of services table and in positions 7 and 10 on the allowed charge table. One is for the interpretation and report of the EKG (93010) and the other is for the EKG with interpretation and report (93000). Allowed charges for these two procedures have increased 18% (93000) and 31% (93010). Manipulation of spine by chiropractor appears on both lists: position 9 on the number of services list and position 18 on the allowed charge list. Its allowed charges have increased 25% from 1986-1988. Because this is the only chiropractic service allowed for Medicare payment it is not surprising that it appears on both lists.

Two general ophthalmological services also appear on both lists. These are general ophthalmological service comprehensive, and general ophthalmological service intermediate. They are position 14 and position 15 on the number of services table and position 14 and position 19 on the allowed charges table. Both of them have also increased substantially in their allowed charges over the three-year period by 49% and 52% respectively.

The first 17 medical procedures in rank on the number of services table are also on the allowed charges table. High expense procedures on the allowed charges list but not on the number of services list are initial consultation, complex; combined left heart catheterization; and echocardiography. These three have grown substantially in allowed charges: initial consultation, complex has increased 46%, combined left heart catheterization 59% and echocardiography 145%.

Surgical Procedures

Tables 26 and 27 show the surgical procedures performed most often (Table 26) and those resulting in the largest amount of allowed charges (Table 27). In analyzing these data it is important to consider the large influence of the procedure venipuncture on the growth in volume of surgical services. The growth in venipuncture actually accounts for two-thirds of the increase in number of services.

Unlike medical procedures, where many procedures appeared on both lists, only four surgical procedures appear on both lists. Most of the procedures that appear on the most often used list were minor surgical procedures. Except for cataract removal (procedure code 66984, position 6 on the number of surgical services list and position 1 on the allowed charges list making up over 17% of all surgical allowed charges), all the other procedures are minor procedures. These include procedures for specimen collection, lesion removal, injections, toenail cutting, and ear wax removal. They also include three diagnostic procedures: sigmoidoscopy (position 11), cystourethroscopy (position 16) and upper gastrointestinal endoscopy (position 19).

Four of the procedures on the most often used list appear on the list of surgical procedures with the most allowed charges: 66984 - cataract surgery (position 1 on the top charges list), 36415 - specimen collection (position 18 on the top charges list), and two diagnostic procedures 43235 - upper gastrointestinal endoscopy (GI) and 45330 - sigmoidoscopy (position 9 and position 19 respectively on the top charges list).

The top charges surgical list is generally composed of expensive surgeries. These include two varieties of cataract removal (accounting for 19.5% of surgical allowed charges), prostate surgery (2.8%), three varieties of CABGs (4.4%), knee and hip replacements (3.7%), and two varieties of hip fractures (2.6%). Also included are two ophthalmological laser procedures (67228 and 65855), one cardiovascular surgery procedure (35301) and partial

Table 26

20 SURGICAL PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986-1988

Rank	% of 1988 Medical Services	Code #	Explanation of Code	# of Services (In Thousands) 1986	1987	1988	% increase 1986-88
1	38.7	36415	Routine Venipuncture for Collection of Specimen(s)	11,425	20,315	25,795	125.8
2	2.2	17000	One Lesion Destruction by Any Method, With or Without Surgical Curettement, All Facial Lesions or Premalignant Lesions in Any Location, Including Local Anesthesia	1,096	1,283	1,453	32.5
3	2.1	17002	Lesion Destruction by Any Method, With or Without Surgical Curettement, All Facial Lesions or Premalignant Lesions in Any Location, Including Local Anesthesia; Over Three Lesions, Each Additional Lesion	863	1,153	1,426	65.2
4	2.0	20610	Arthrocentesis, Aspiration and/or Injection; Major Joint or Bursa (e.g., Shoulder, Hip, Knee Joint Subacromial Bursa)	1,190	1,282	1,326	11.4
5	1.9	17001	Lesion Destruction by Any Method, With or Without Surgical Curettement, All Facial Lesions or Premalignant Lesions in Any Location, Including Local Anesthesia; Second and Third Lesions, Each	818	1,065	1,287	57.3
6	1.8	66984	Extracapsular Cataract Removal W/Insertion of Intraocular Lens Prosthesis (One Stage Procedure)	807	1,030	1,169	44.8
7	1.7	11700	Debridement of Nails, Manual; 5 or Less	877	1,005	1,166	32.9
8	1.3	11710	Debridement of Nails, Electric Grinder; 5 or Less	829	945	846	2.1
9	1.2	11701	Debridement of Nails, Manual; Each Additional, 5 or Less	508	651	825	62.6
10	1.2	11711	Debridement of Nails, Electric Grinder; Each Add., 5 or Less	506	625	812	60.7
11	1.2	45330	Sigmoidoscopy, Flexible Fiberoptic; Diagnositc	455	721	787	73.0
12	1.1	11730	Avulsion of Nail Plate, Partial or Complete, Simple; Single	685	767	711	3.9

Table 26 (Concluded)

20 SURGICAL PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986-1988

Rank	% of 1988 Medical Services	Code #	Explanation of Code	# of Services (In Thousands)			% increase 1986-88
				1986	1987	1988	
13	1.0	17100	One Lesion Destruction by Any Method of Benign Skin Lesions on Any Area Other Than The Face, Including Local Anesthesia	597	664	694	16.1
14	1.0	11100	Biopsy of Skin, Subcutaneous Tissue and/or Mucous Membrane (Including Simple Closure), Unless Otherwise Listed; One Lesion	563	637	682	21.1
15	1.0	17102	Lesion Destruction by Any Method of Benign Skin Lesions on Any Area Other Than The Face, Including Local Anesthesia; Over Two Lesions, Each Additional Lesion Up to 15 Lesions	501	621	672	34.1
16	1.0	52000	Cystourethroscopy (Separate Procedure)	571	631	639	12.0
17	0.9	11000	Debridement of Extensive Eczematous or Infected Skin; Up to 10% of Body Surface	475	553	588	23.9
18	0.8	20550	Injection, Tendon Sheath, Ligament, Trigger Points or Ganglion Cyst	432	496	554	28.3
19	0.8	43235	Upper Gastrointestinal Endoscopy, Including Esophagus, Stomach, and Either the Duodenum and/or Jejunum As Appropriate; Complex Diagnostic	423	491	525	23.9
20	0.7	69210	Removal of Impacted Cerumen (Separate Procedure), One or Both Ears	341	415	487	42.9

Table 27

20 SURGICAL PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986-1988

Rank	% of 1988 Surgical Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986-88
1	17.3	66984	Extracapsular Cataract Removal W/Insertion of Intraocular Lens Prosthesis (One Stage Procedure)	1,176,865	1,505,455	1,648,932	40.1
2	2.8	52601	Transurethral Resection of Prostate, Including Control of Postoperative Bleeding, Complete	244,975	287,144	265,280	8.3
3	2.2	66821	Discission of Secondary Membraneous Cataract and/or Anterior Hyaloid; Laser Surgery (One or More Stages)	53,157	133,629	207,993	291.3
4	1.9	33512	Coronary Artery Bypass, Autogenous Graft; Three Coronary Arteries	137,541	168,365	182,911	33.0
5	1.9	27447	Arthroplasty, Knee, Condyle and Plateau; Medial and Lateral Compartments W/Without Patella Resurfacing (Total Knee Replacement)	129,759	164,982	182,073	40.3
6	1.8	45378	Colonoscopy, Fiberoptic, Beyond Splenic Flexure; Diagnostic Procedure	103,183	137,705	174,401	69.0
7	1.8	27130	Arthroplasty, Acetabular and Proximal Femoral Prosthetic Replacement (Total Hip Replacement); Simple	136,853	166,131	169,453	23.8
8	1.7	33513	Coronary Artery Bypass, Autogenous Graft; Four Coronary Arteries	118,138	149,509	160,789	36.1
9	1.6	43235	Upper Gastrointestinal Endoscopy, Including Esophagus, Stomach, and Either the Duodenum and/or Jejunum As Appropriate; Complex Diagnostic	120,376	148,899	156,337	29.9
10	1.6	45385	Colonoscopy, Fiberoptic, Beyond Splenic Flexure; For Removal of Polypoid Lesion(s)	90,618	122,367	147,762	63.1
11	1.3	27244	Open Treatment of Closed or Open Interrochanteric, Pertrochanteric, or Subtrochanteric Femoral Fracture, with Internal Fixation	104,764	116,213	120,301	14.8

Table 27 (Concluded)

20 SURGICAL PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Surgical Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986–88
12	1.1	43239	Upper Gastrointestinal Endoscopy, Including Esophagus, Stomach, and Either the Duodenum and/or Jejunum As Appropriate; For Biopsy and/or Collection Of Specimen by Brushing or Washing	78,885	98,646	108,086	37.0
13	1.0	67228	Destruction of Extensive or Progressive Retinopathy, One or More Sessions; Photocoagulatin	59,802	84,840	94,114	57.4
14	1.0	35301	Thromboendarterectomy, W/Without Patch Graft; Carotid, Vergebral, Subclavian, by Neck Incision	90,144	96,903	90,620	0.5
15	0.9	44140	Colectomy, Partial; With Anastomosis	84,985	91,521	90,131	6.1
16	0.9	65855	Trabeculoplasty by Laser Surgery, One or More Sessions	50,828	72,235	81,138	59.6
17	0.8	33511	Coronary Artery Bypass, Autogenous Graft; Two Coronary Arteries	59,848	71,230	77,723	29.9
18	0.8	36415	Routine Venipuncture for Collection of Specimen(s)	34,787	60,917	77,681	123.3
19	0.8	45330	Sigmoidoscopy, Flexible Fiberoptic; Diagnositc	40,285	89,414	76,734	90.5
20	0.8	27236	Open Treatment of Closed or Open Femoral Fracture, Proximal End, Neck, Internal Fixation or Prosthetic Replacement	78,971	78,907	75,805	-4.0

colectomy (44140). Also on the list are four diagnostic procedures: two colonoscopies, an upper GI, and a sigmoidoscopy.

The percentage increases in the use of venipuncture, the most common procedure, was 126%. The allowed charges for the procedure increased 123% to 77.7 million dollars in 1988. The expensive surgeries also increased substantially. The cataract surgeries (position 1 and position 3 on the top allowed charges list) allowed charges increased 40% and 291%. The CABGs allowed charges increased 33% (3 arteries), 36% (4 arteries) and 30% (2 arteries). The knee replacement (27447) allowed charges increased 40% and hip replacement (27130) 24% over the three-year period. One hip fracture procedure (27244) allowed charges increased 15% while the other (27236) decreased 4% and prostate surgery (52601) allowed charges increased 8.3%. The two ophthalmologic laser surgeries' allowed charges increased 57% (67228) and 60% (65855). Cardiovascular surgery (35301) allowed charges only increased 1%, and partial colectomy (44140) allowed charges increased 6%. The two colonoscopy procedures' allowed charges increased 69% and 63% and the other two diagnostic procedures, upper GI and sigmoidoscopy had increases of 37% and 91% respectively in their allowed charges. In general, the most common procedures and those resulting in the greatest allowed charges in general appear to be increasing more quickly.

Radiology Procedures

Eleven radiology procedures appear on both the high volume and high charges lists (see Tables 28 and 29). The two chest x-rays (2 views and 1 view) comprise 38% of all radiological services and 15% of all radiology allowed charges. Mammography is third on both lists comprising 3.4% of the number of x-ray procedures billed and 2.9% of all the allowed charges for radiology procedures.

Appearing among the 20 most common radiology services were a variety of x-rays (abdomen, hip, knee, spine, colon, shoulder, foot, pelvis, spine), 2 cat scans of the brain, an echography of the abdomen, bone imaging (nuclear

Table 28

20 RADIOLOGY PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986–1988

Rank	% of 1988 Radiology Services	Code #	Explanation of Code	# of Services (In Thousands) 1986	1987	1988	% increase 1986–88
1	20.1	71020	Radiologic Examination, Chest, 2 Views, Frontal & Lateral	13,538	14,696	15,327	13.2
2	16.4	71010	Radiologic Examination, Chest; Single View, Frontal	10,991	11,837	12,560	14.3
3	2.9	76091	Mammography; Bilateral	1,127	1,694	2,185	93.9
4	2.3	74000	Radiologic Examination, Abdomen; Single Anteroposterior View	1,530	1,688	1,729	13.0
5	2.0	73510	Radiologic Examination, Hip; Complete, Minimum of Two Views	1,341	1,466	1,541	14.9
6	2.0	77410	Daily Megavolt Treatment Management; Simple	1,341	1,591	1,494	11.4
7	1.8	77405	Daily Megavolt Treatment Management; Intermediate	1,549	1,569	1,388	-10.4
8	1.3	70450	CAT Scan, Head or Brain; W/O Contrast Material	754	916	1,031	36.6
9	1.3	73560	Radiologic Examination, Knee; Anteroposterior and Lateral Views	882	945	984	11.5
10	1.3	74020	Radiologic Examination, Abdomen; Complete, Including Decubitus and/or Erect Views	847	925	969	14.5
11	1.2	72110	Radiologic Examination, Spine, Lumbosacral; Complete With Oblique Views	859	912	944	10.0
12	1.2	76700	Echography, Abdominal, B-Scan and/or Real Time With Image Documentation; Complete	840	842	943	12.3
13	1.1	74270	Radiologic Examination, Colon; Barium Enema	984	952	863	-12.3
14	1.1	77400	Daily Megavolt Treatment Management; Complex	1,146	1,091	848	-26.0
15	1.1	73030	Radiologic Examination, Shoulder; Complete Minimum of Two Views	713	796	847	18.8
16	1.1	73630	Radiologic Examination, Foot; Complete Minimum of Three Views	717	796	826	15.2
17	1.0	72170	Radiologic Examination, Pelvis; Anteroposterior Only	704	762	789	12.0
18	1.0	78306	Bone Imaging; Whole Body	604	642	735	21.7
19	1.0	72100	Radiologic Examination, Spine, Lumbosacral; Anteroposterior and Lateral	662	714	735	11.0
20	1.0	70470	CAT Scan, Head or Brain; W/O Contrast Material Followed By Contrast Material(s) and Further Sections	693	735	727	4.9

Table 29

20 RADIOLOGY PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Radiology Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986–88
1	9.7	71020	Radiologic Examination, Chest, 2 Views, Frontal & Lateral	276,741	320,042	336,532	21.6
2	5.0	71010	Radiologic Examination, Chest; Single View, Frontal	142,325	162,457	172,062	20.9
3	3.4	76091	Mammography; Bilateral	54,791	87,896	116,378	112.4
4	3.0	70450	CAT Scan, Head or Brain; W/O Contrast Material	69,049	91,776	105,247	52.4
5	2.9	70470	CAT Scan, Head or Brain; W/O Contrast Material Followed By Contrast Material(s) and Further Sections	82,440	98,387	100,776	22.2
6	2.7	77410	Daily Megavolt Treatment Management; Simple	69,330	95,636	95,018	37.1
7	2.3	74160	Computerized Axial Tomography, Abdomen; W/Contrast Materials	51,761	67,740	80,694	55.9
8	2.1	70551	Magnetic Resonance (e.g., Proton) Imaging, Brain (Including Brain Stem)	23,695	48,929	73,893	211.9
9	2.1	76700	Echography, Abdominal, B-Scan and/or Real Time With Image Documentation; Complete	55,259	61,615	72,056	30.4
10	2.0	77405	Daily Megavolt Treatment Management; Intermediate	64,371	72,007	68,667	6.7
11	1.8	78306	Bone Imaging; Whole Body	45,029	50,330	62,630	39.1
12	1.6	76629	Echocardiography, Chest, M-Mode and Real Time W/Image Documentation	13,651	25,355	56,825	316.3
13	1.5	76516	Ophthalmic Biometry by Ultrasound Echography, A-Mode	82,510	79,769	50,864	-38.4
14	1.5	74170	Computerized Axial Tomography, Abdomen; W/O Contrast Material, Followed by Contrast Material(s) and Further Sections	33,380	42,686	50,198	50.4
15	1.3	76519	Ophthalmic Biometry by Ultrasound Echography, A-Mode; With Intraocular Lens Power Calculation	15,028	35,662	44,426	195.6

Table 29 (Concluded)

20 RADIOLOGY PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Radiology Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986–88
16	1.2	73510	Radiologic Examination, Hip; Complete, Minimum of Two Views	33,528	39,511	42,441	26.6
17	1.2	72110	Radiologic Examination, Spine, Lumbosacral; Complete With Oblique Views	33,905	38,718	40,701	20.0
18	1.1	74270	Radiologic Examination, Colon; Barium Enema	40,005	40,279	37,088	-7.3
19	1.0	72131	Computerized Axial Tomography, Lumbar Spine; W/O Contrast Material	23,029	30,425	35,595	54.6
20	1.0	78461	Myocardial Imaging; Exercise & Redistribution Qualitative or Quanitative, W/Without Pharmacological Intervention	N/A*	18,439	35,271	N/A

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* Not Applicable -- Code Did Not Exist in 1986

medicine) and three management fees for "radiotherapy". The nine radiology procedures that were among those with the largest allowed charges but not among those with the largest number of services were three CAT scans (two of the abdomen and one of the lumbar spine), two cardiovascular procedures (echocardiography and myocardial imaging), two ophthalmic biometries by ultrasound echography, echography of the abdomen and magnetic resonance imaging of the brain.

Allowed charges for all the top twenty allowed dollars radiology procedures increased rapidly over the three-year period with the exception of the less complex of the ophthalmic biometry procedures which decreased 38%. However, the other ophthomologic procedure which included an intraocular lens power calculation in addition to the ophthalmic biometry increased 196%.

Laboratory Procedures

Tables 30 and 31 show the 20 laboratory procedures most commonly received and the 20 resulting in the most allowed charges. As with the radiological procedures, many of the same procedures are on both lists. Thirteen of the 20 top number of services also appear on the top allowed charges list. Urinalysis, the most commonly ordered procedure representing 9% of all the laboratory services provided, was fourth on the list of allowed charges. It resulted in 4% of the total laboratory allowed charges. Resulting in even more laboratory allowed charges was code 80019, 19 or more automated chemistry tests, which made up 8% of the laboratory allowed charges and two surgical pathology codes (88304 and 88305), which together make up 11% of laboratory allowed charges. Two travel allowance codes also made the top 20 number of services list. These Level II HCPCS codes were contained in the "P" series of laboratory services, which was included, intact, within the procedure file. A code-for-code review of all of the Level II series was not conducted for any series except the "M" codes (see Technical Issues Memo #5). If we had, we probably would have deleted these travel codes; however, their inclusion is interesting to note because of the dramatic increase in their use, which was up 1146% and 5442% from 1986 to 1988.

Table 30

20 LABORATORY PROCEDURES HAVING THE LARGEST NUMBER OF SERVICES IN 1988, 1986–1988

Rank	% of 1988 Laboratory Services	Code #	Explanation of Code	# of Services (In Thousands)			% increase 1986–88
				1986	1987	1988	
1	9.4	81000	Urinalysis; Routine, With Microscopy	14,623	13,680	15,268	4.4
2	7.6	80019	Automated Multichannel Test; 19 or More Clinical Chemistry Tests	10,324	8,128	12,364	19.8
3	5.0	82947	Glucose (Except Urine)	7,996	7,646	8,098	1.3
4	2.9	85025	Hemogram & Platelet Count, Automated, and Automated Complete Differential WBC Count	913	2,707	4,743	419.7
5	2.8	82270	Blood; Occult, Feces, Screening	3,849	3,643	4,625	20.2
6	2.8	85022	Hemogram, Automated & Manual Differential WBC Count	6,095	5,717	4,595	–24.6
7	2.5	85610	Prothrombin Time	3,461	3,667	4,134	19.5
8	2.1	83718	Lipoprotein High Density Cholesterol by Precipitation Method	1,033	2,354	3,372	226.4
9	2.1	84436	Thyroxine, True (TT–4), RIA	2,327	2,816	3,343	43.7
10	1.9	P9603	Travel Allowance – Prorated Miles Actually Travelled	249	2,169	3,099	1146.0
11	1.9	88304	Surgical Pathology, Gross & Microscopic Examination of Presumptively Abnormal Tissue(s); Uncomplicated Screening	2,571	2,859	3,009	17.0
12	1.7	84132	Potassium; Blood	2,680	2,644	2,701	0.8
13	1.6	85031	Blood Count; Hemogram; Manual, Complete CBC	3,160	2,745	2,602	–17.7
14	1.6	85021	Hemogram, Automated	2,277	2,387	2,544	11.7
15	1.5	P9604	Travel Allowance – Prorated Trip Charges	45	2,009	2,511	5442.0
16	1.4	83720	Lipoprotein Cholesterol Fractionatin Calculation by Formula	92	337	2,317	2429.4
17	1.3	87086	Urine Bacterial Culture, Qualitative, Colony Count	1,580	1,829	2,090	32.3
18	1.2	85023	Hemogram and Platelet Count, Automated & Manual Diff. Differential WBC Count	455	1,364	1,969	332.4
19	1.2	82465	Cholesterol, Serum, Total	693	1,102	1,958	182.5
20	1.1	85651	Sedimentation Rate; Westergren type	1,309	1,553	1,856	41.8

Table 31

20 LABORATORY PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Laboratory Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986–88
1	8.1	80019	Automated Multichannel Test; 19 or More Clinical Chemistry Tests	119,849	143,867	152,215	27.0
2	5.7	88304	Surgical Pathology, Gross & Microscopic Examination of Presumptively Abnormal Tissue(s); Uncomplicated Screening	81,582	98,275	107,319	31.5
3	5.6	88305	Surgical Pathology, Gross & Microscopic Examination of Presumptively Abnormal Tissue(s); Single Complicated or Multiple Uncomplicated Specimen(s), W/O Complex Dissection	67,669	90,633	104,537	54.5
4	3.9	81000	Urinalysis; Routine, With Microscopy	74,815	73,767	73,624	–1.6
5	2.9	85025	Hemogram & Platelet Count, Automated, and Automated Complete Differential WBC Count	10,500	31,679	53,637	410.8
6	2.5	82947	Glucose (Except Urine)	48,874	49,815	46,969	–3.9
7	2.4	88307	Surgical Pathology, Gross & Microscopic Examination of Presumptively Abnormal Tissue(s); Single Complicated Specimen Requiring Complex Dissection Or Multiple Complicated Specimens	30,427	39,520	44,980	47.8
8	2.2	84443	Thyroid Stimulating Hormone, RIA	20,841	30,850	41,742	100.3
9	2.1	83720	Lipoprotein Cholesterol Fractionation Calculation by Formula	1,448	5,123	38,749	2576.3
10	2.1	85022	Hemogram, Automated & Manual Differential WBC Count	53,174	52,894	38,483	–27.6
11	2.0	83718	Lipoprotein High Density Cholesterol by Precipitation Method	11,895	28,470	37,993	219.4
12	1.9	82643	Digoxin, RIA	28,502	34,056	35,210	23.5

Table 31 (Concluded)

20 LABORATORY PROCEDURES HAVING THE LARGEST PERCENTAGE OF ALLOWED CHARGES IN 1988, 1986–1988

Rank	% of 1988 Laboratory Allowed $	Code #	Explanation of Code	Allowed $ (In Thousands) 1986	1987	1988	% increase 1986–88
13	1.7	88309	Surgical Pathology, Gross & Microscopic Examination of Presumptively Abnormal Tissue(s); Complex Diagnostic Problem W/Without Extensive Dissection	21,608	28,757	31,951	47.9
14	1.7	84436	Thyroxine, True (TT–4), RIA	24,054	28,246	31,699	31.8
15	1.3	85610	Prothrombin Time	21,860	24,963	24,932	14.1
16	1.3	88331	Consultation During Surgery; W/Frozen Section(s), Single Specimen	16,624	22,432	24,396	46.8
17	1.3	87086	Urine Bacterial Culture, Qualitative, Colony Count	18,510	22,236	24,077	30.1
18	1.3	85023	Hemogram and Platelet Count, Automated & Manual Diff. Differential WBC Count	4,377	16,087	23,622	439.7
19	1.2	85031	Blood Count; Hemogram, Manual, Complete CBC	27,743	25,337	22,959	–17.2
20	1.2	80061	Lipid Profile	3,272	9,103	21,853	567.9

Also on the top 20 laboratory services list are five procedures which are variations on the complete blood count (CBC). They are position 4 (85025), and position 7 (85022), position 13 (85031), position 14 (85021) and position 18 (85025). They involve different combinations of the following tests: hematocrit, hemoglobin, platelet count, total white blood cell count, and differential white blood cell count. The platelet count and the platelet count and WBC differential is not done for some of these codes. The different codes also represent different degrees of automation of the tests. Together they made up 10% of all the services. Four of these CBC tests appear on the top 20 allowed charges lists (85025, 85022, 85023 and 85031), accounting for 8% of laboratory allowed charges.

Several others of the codes on the top 20 laboratory services list involve more than one test. 84436 involves two thyroid tests (Total T-4 and True T-4), 83720 involves three cholesterol tests (cholesterol, triglycerides and high density lipoprotein (HDL) cholesterol). From these three, a low density lipoprotein (LDL) cholesterol is calculated. The Lipid Profile test (80061) which appears as position 20 on the top allowed charges list usually contains the same tests as 83720 but the LDL cholesterol may or may not be calculated.

The seven procedures which appear on the top 20 laboratory allowed charge table but not the top 20 number of services table include four pathology services and three other procedures. The pathology services were three types of gross and neuroscopic examinations and one consultation during surgery. The three other procedures were thyroid stimulating hormone (84443, two tests to measure thyroid functioning), digoxin (82643, used to monitor the amount of digoxin being absorbed by patients taking the drug digoxin), and lipid profile (80061, usually three tests to measure cholesterol levels).

In general, the increase in use of the tests over the three-year period was substantial. Six of the codes on the top 20 allowed charges table show increases in allowed charges over 100%. These six are: lipoprotein cholesterol fractionation calculation by formula (+2576%); lipid profile (+568%); hemogram and platelet count automated and manual differential WBC count (+440%); hemogram, platelet count automated, and automated complete differential WBC count (+411%); high density lipoprotein (HDL) cholesterol by precipitation method (+219%); and thyroid stimulating hormone (+100%). Two things stand out in examining the data: (1) the increase in laboratory automation especially for the complete blood count tests and (2) the dramatic increase in the use of cholesterol measurement tests.

Changes in Selected Utilization Measures Per Provider Number, 1986-88

Information to be presented in this section of the chapter was from an analysis of the 1986-88 provider files. The provider file, as described in Chapter 3, is all the claims of a 5% sample of provider numbers. Sampling procedures require that once a provider number is in the sample the number should remain in the sample until the provider discontinues participation in the program. The data presented in Chapter 3 do not necessarily reflect adherence to this procedure. The file is also problematic because carriers assign provider numbers inconsistently. In addition, some data in the file appear to be incorrect. For that reason, those areas for which Massachusetts Blue Shield is the carrier, (i.e, Massachusetts (carrier 00700), Maine (carrier 21200) and New Hampshire and Vermont (carrier 00780)) have been dropped from the national tables for all years. They do, however, appear in the carrier tables. Because of the problems described in the earlier chapters and numerous unexplained anomalies in the tables reported below, findings from analysis of this data file should be used cautiously. (Reference may also be made to Supplemental Table 5, Distributions of a Provider File Subsample, for additional data on selected provider file fields.)

Differences between the procedure and provider file data are highlighted below for the five fields for which comparisons can be made. These fields are: number of services, number of RVUs, allowed charges, billed charges, and allowed charges per RVU. To get the data in column 1 for the first four variables the three carriers who were omitted from the provider file totals are subtracted from the procedure totals. To get the corresponding data in column 2 for the first four variables, the provider file totals are multiplied by 20. This is because the file is designed to be a 5% sample. The fifth variable, allowed charges per RVU, is taken from the total data for the respective files. These data are presented below for 1986, 1987, and 1988. The first four variables are reported per thousand.

1986	Procedure	Provider
Number of Services	530,754	541,396
Number of RVUs	5,533,554	6,326,999
Allowed Charges	20,224,559	20,420,011
Billed Charges	28,197,849	28,472,232
Allowed Charges Per RVU	3.65	3.23

1987		
Number of Services	578,757	571,486
Number of RVUs	6,010,480	5,972,015
Allowed Charges	23,676,210	23,365,427
Billed Charges	32,315,111	31,869,918
Allowed Charges Per RVU	3.93	3.91

1988		
Number of Services	629,601	729,912
Number of RVUs	6,502,383	7,284,331
Allowed Charges	25,639,890	28,723,969
Billed Charges	36,084,666	40,880,347
Allowed Charges Per RVU	3.94	3.94

Note that in general the numbers are reasonably close. In 1986, the provider file indicates a larger total number of services (+2%), RVUs (+14%), allowed charges (+1%), and billed charges (+1%). The allowed charges per RVU are 12% less in the data shown in the provider file than in the procedure file. In 1987, the provider file indicated a smaller number of services (-1%), RVUs (-1%), allowed charges (-1%), and billed charges (-1%). Allowed charges per RVU were also 1% smaller in the provider file than in the procedure file. In 1988 the provider file again indicated a larger total number of services (+16%), RVUs (+12%), allowed charges (+12%), and billed charges (+13%). Allowed charges per RVU were identical in 1988 in both files.

It should be remembered that these two data files are constructed using different methodologies by different systems professionals at the carriers.

Without more carrier-specific research, it would be difficult to speculate further about the reasons for the difference between the two files.

Below we examine the data from these files for the nation. Then we discuss findings by carrier, by specialty of the provider number, by procedure group, by place of service and by the level (low, medium, high) of assigned services for the provider number. Detailed tables are presented in Attachment 2 to this report.

Table 32 shows the overall growth in provider numbers, beneficiary/provider number combinations, services, RVUs, allowed and billed charges, 1986-88. Note that the national data presented here and in the following tables do not include the areas where Massachusetts Blue Shield is the carrier.

In general, the trend shown is for a very small increase in provider numbers and a large increase in beneficiaries using services and thus in beneficiary/provider combinations. The number of provider numbers in this 5% sample file is about 35,000 in all three years. However, the number of providers may be increasing without a change in the number of provider numbers. The number of beneficiaries per provider number has increased from 151 to 215 from 1986 to 1988.

The number of services per provider number has increased 33% and the number of RVUs per provider number only 14%. RVUs per service, a measure of intensity, can be calculated from Table 3 data by dividing the number of RVUs by the number of services. This resulting indicator declined from 11.7 in 1986 to 10.0 or 15% from 1986 to 1988. Allowed charges have increased 41% and billed charges 44%. These increases are 14% higher for allowed charges and 15% higher for billed charges in the provider file than in the procedure file analyzed earlier. Allowed charges per RVU have increased 22%. Billed charges per provider number increased 42% from $40,617 in 1986 to $57,576 in 1988, and allowed charges per provider number increased 39% from $29,130 to $40,455 in 1988. Note that the decrease in RVUs per service is much more pronounced than the decrease found in the provider file analysis (15% versus 1%) and that the increase in allowed charges per RVU is much greater (22% versus 8%).

Table 32

GROWTH IN PROVIDER NUMBERS, BENEFICIARY/PROVIDER NUMBER COMBINATIONS, SERVICES, RVUs, ALLOWED CHARGES, AND BILLED CHARGES, 1986 - 1988

		YEAR			
		1986	1987	1988	% change
CARRIER					
ALL	# PN	35,050	34,442	35,501	1.29
	# BENP	5,278,144	5,673,393	7,623,738	44.44
	# BENP per PN	150.588987	164.723099	214.747133	42.60
	# Services	27,069,785	28,574,285	36,495,605	34.82
	# Services per PN	772.319115	829.634893	1,028.016253	33.11
	# Services per BENP	5.128656	5.036542	4.787101	-6.66
	# RVUs	316,349,932	298,600,761	364,216,525	15.13
	# RVUs per PN	9,025.675669	8,669.669642	10,259.331429	13.67
	# RVUs per BENP	59.935828	52.631778	47.774008	-20.29
	Allowed $	1,021,000,535	1,168,271,352	1,436,198,444	40.67
	Allowed $ per PN	29,129.829830	33,919.962615	40,455.154624	38.88
	Allowed $ per BENP	193.439310	205.921104	188.385073	-2.61
	Allowed $ per RVU	3.227440	3.912486	3.943254	22.18
	Billed $	1,423,611,578	1,593,495,913	2,044,017,351	43.58
	Billed $ per PN	40,616.592814	46,266.067990	57,576.331693	41.76
	Billed $ per BENP	269.718214	280.871766	268.112224	-0.60

PN = Provider number
BENP = Unique beneficiary/provider combinations

By Carrier

Table 33 shows summary data for the 10 carriers having the largest percentage of eligibles and allowed charges. Together these 10 carriers have 47% of the eligibles and 54% of the allowed charges. As can be seen in that table, at least two carriers have suspect data. New Jersey shows a 251% increase in services from 1986-88 and New York (Empire) shows a very low allowed dollars per RVU in 1986. The New Jersey problem may be related to a change in carrier for that state in 1988.

In general, the data demonstrate the variation across the carriers on a number of dimensions: number of services per provider number, number of RVUs per provider number, allowed charges per RVU, and allowed dollars per provider number. Number of services per provider number vary from a low of 845 in Texas to a high of 2006 in Pennsylvania. The percentage change in this ratio also varies widely from a 3% decrease in Michigan to a 26% increase in Texas. RVUs per provider number ranged from 9,851 in Texas to 25,162 in New York (Empire). The increase ranged from a 63% decrease in New York (Empire) to a 30% increase in Texas.

Allowed charges per RVU were highest in the two California carriers, $4.41 and $4.66 respectively, and lowest (excluding New York) in Michigan where they were $2.96. The percentage change in charges per RVU ranged from 3% in the California (Blue Shield) to 21% in Michigan. Allowed charges per provider number were highest in Pennsylvania, $68,825, followed closely by the two California carriers, Florida and New Jersey. The lowest allowed charges per provider number was in Texas, $34,159. Excluding New Jersey, percentage changes in allowed charges per provider number ranged from 10% in Northern California to 38% in Pennsylvania.

By Specialty

Because this analysis focused on provider numbers, we decided to use a finer breakdown of provider specialty. Rather than the four categories used

Table 33

NUMBER OF SERVICES PER PROVIDER NUMBER, NUMBER OF RVUs PER PROVIDER NUMBER, ALLOWED CHARGES PER RVU, AND ALLOWED CHARGES PER PROVIDER NUMBER, BY SELECTED CARRIERS, 1986 – 1988

	# Services/PN		# RVUs/PN		Allowed $/RVU		Allowed $/PN	
	1986	% Change	1986	% Change	1986	% Change	1986	% change
CA Blue Shield	1,322	4.8	13,040	6.8	4.41	3.1	57,466	10.1
CA Transamerica	1,104	13.5	13,096	18.6	4.66	3.5	61,094	22.7
TX	845	25.5	9,581	29.5	3.57	6.8	34,159	38.4
FL	1,752	10.7	16,286	8.9	3.70	13.3	60,187	23.4
IL	1,285	7.6	13,115	18.7	3.50	8.4	45,922	28.6
MI	1,757	-2.9	16,148	7.6	2.96	20.8	47,854	30.0
OH	1,212	6.2	11,662	17.9	3.25	16.0	37,872	36.7
NJ	1,262	250.5 *	14,456	89.1	3.92	-9.5	56,701	71.1 *
NY Empire	880	3.1	25,162	-62.9	1.72 *	198.4	43,389	10.9
PA	2,006	12.0	18,055	27.4	3.81	8.5	68,825	38.3

* Problem in NJ with a very large number of services in 88, NY Empire with a small allowed charge per RVU.

in the procedure file analysis, we expanded our categories to eight. These are: general practice, internal medicine, medical specialties, general surgery, surgical specialties, other physician specialties (e.g., neurology, pathology, physical medicine, radiology), clinics and groups, other non-physicians providers (e.g., chiropractors, optometrists, group practice PT and OT). The distribution of these specialties is shown in Table 34 and is similar in the three years. It is important to note that single specialty groups should be identified by their specialty, as opposed to "clinic and group" category, which is limited to x-ray and laboratory groups and multispecialty groups. The surgical specialties are the largest categories in all years. The general practitioners are second, followed by the other non-physicians, the internists, medical specialists, general surgeons and the clinics and groups.

Services per provider number ranges from a low of 380 for general surgery to 2,350 for clinics and groups (Table 35). General surgeons and surgical specialists were on the low end of services per provider number, general practitioners, other non-physicians, and other physician specialists were around the mean and the internists and medical specialists were above the mean number of services per provider number. The number of RVUs per provider number ranges from a low of 3,263 for other physicians to a high of 24,522 for clinics and groups. Other specialties on the low end of the number of RVUs per provider number are general practitioners. In the medium range are internists, and surgical specialists. At the high end are general surgeons, medical specialists and other physicians.

Allowed charges per RVU and allowed charges per provider number are also shown in Table 35. As can be seen, other physicians seem to have suspiciously low data for allowed charges per RVU in 1986 and experience an out of the ordinary increase in that rate. Because anesthesiologists are classified as other physicians, these problem data may be due to difficulties in the coding of anesthesia services in 1986. However, we have no direct evidence that this is the problem.

Table 34

NUMBER OF PROVIDER NUMBERS, BY SPECIALTY, 1986 - 1988

	1986		1987		1988	
	Number	%	Number	%	Number	%
Total, All Specialties	35,050	100.0	34,442	100.0	35,501	100.0
General Practice	6,987	19.9	7,014	20.4	6,691	18.8
Internal Medicine	5,141	14.7	4,949	14.4	5,057	14.2
Medical Specialties	2,609	7.4	2,672	7.8	2,881	8.1
General Surgery	2,060	5.9	2,004	5.8	1,944	5.5
Surgical Specialties	7,486	21.4	7,317	21.2	7,477	21.1
Other Physician Specialties	4,761	13.6	4,699	13.6	4,965	14.0
Clinics and Groups	880	2.5	662	1.9	822	2.3
Other Non-Physician Providers	5,126	14.6	5,125	14.9	5,664	16.0

Table 35

NUMBER OF SERVICES PER PROVIDER NUMBER, NUMBER OF RVUs PER PROVIDER NUMBER, ALLOWED CHARGES PER RVU, AND ALLOWED CHARGES BY PROVIDER NUMBER, BY SPECIALTY, 1986 – 1988

	Services/PN		RVUs/PN		Allowed $/RVU		Allowed $/PN	
	1986	% Change	1986	% Change	1986	% Change	1986	% Change
Total, All Specialties	772	33.1	9,026	13.7	3.23	22.2	29,130	38.9
General Practice	623	19.3	4,241	14.8	2.92	15.9	12,381	33.1
Internal Medicine	1,243	13.3	8,775	9.7	3.72	14.3	32,604	25.4
Medical Specialties	1,126	31.2	12,369	34.0	3.92	9.3	48,505	46.5
General Surgery	380	19.2	11,128	16.6	3.46	8.1	38,531	26.1
Surgical Specialties	417	29.4	9,757	32.3	3.92	3.3	38,228	36.6
Other Physician Specialties	766	20.0	15,767	-34.1	1.78 *	119.1 *	28,040	44.5
Clinics and Groups	2,350	47.6	24,522	43.2	3.78	10.2	92,746	57.8
Other Non-Physician Providers	735	87.9	3,263	78.4	3.57	-7.9	11,640	64.2

* Problem data. Very small allowed charge per RVU for other physicians in 1986.

As can be seen in Table 35, the allowed charges per RVU range from $2.92 for general practitioners to $3.92 for medical specialties. Increases were highest for general practitioners, internists and clinics and groups, and lowest for the surgical specialists. Allowed dollars per provider number were highest for the clinics and groups ($92,746), followed by the medical specialists ($48,505), general surgeons ($38,531), and surgical specialists ($38,228). They are lower for the internists ($32,604), other physicians ($28,040), general practitioners ($12,381) and other non-physicians ($11,640).

By Procedure Group

Over the three years of the study, approximately 44% of allowed charges are for medical procedures, 36% for surgical, 13% for radiology and 7% for laboratory.

Table 36 shows services per provider number, RVUs per provider number, services per provider number, RVUs per provider number, the allowed charges per RVU, and the allowed charges per provider number for each procedure group and place. Note that the RVUs by procedure group are the RVUs for that group. The RVUs by place of service are medical RVUs. By procedure group, the services per provider number have increased most dramatically for laboratory services (+75%) and surgery services (+45%). Radiology and medical services have increased at a smaller rate per provider number (28% and 17% respectively). RVUs per provider number have increased the most for laboratory services (93%), followed by radiology (41%). Medical procedures have increased 21% but surgical procedures decreased 10%.

Surgical allowed charges per RVU show the greatest increase, increasing almost 43%. Medical procedures increased 13%, radiology 9% and laboratory 0.1%. This increase in surgical allowed charges per RVU is not consistent with what was found in the procedure file analysis reported on earlier in this chapter. Further examination of these data indicate that the increase in surgical allowed charges per RVU is centered in one specialty, other physicians. For other physicians, allowed charges per RVU increased 89.7%

Table 36

NUMBER OF SERVICES PER PROVIDER NUMBER, NUMBER OF RVUs PER PROVIDER NUMBER, ALLOWED CHARGES PER RVU, AND ALLOWED CHARGES PER PROVIDER NUMBER, BY PROCEDURE GROUP AND PLACE OF SERVICE, 1986 – 1988

	Services/PN		RVUs/PN		Allowed $/RVU*		Allowed $/PN	
	1986	% Change	1986	% Change	1986	% Change	1986	% Change
Total	772	33.1	9,026	13.7	3.23	22.2	29,130	38.9
By Procedure								
Medical	446	17.1	3,526	20.9	3.65	12.7	12,886	36.3
Surgical	69	44.5	181	-10.1	59.90	42.6 **	10,842	28.3
Radiology	92	28.4	626	41.2	5.78	8.6	3,615	53.3
Laboratory	164	74.5	2,258	92.9	0.79	0.1	1,787	93.1
By Place								
Office	383	24.0	2,515	26.9	3.96	9.8	9,951	39.4
Inpatient	222	14.1	4,722	-10.2	2.81	41.2 **	13,286	26.7
Outpatient	57	34.7	1,071	50.5	3.33	8.7	3,568	63.6
Other	110	102.4	718	69.6	3.24	-0.7	2,325	68.3

* RVUs for all services are medical RVUs. RVUs for each of the procedure groups are the RVUs for that procedure group.

** Problem data. Surgical procedures and inpatient hospital services have suspiciously large changes in allowed charges per RVU.

from $5.58 in 1986 to $55.62 in 1988. The $5.58 allowed charges per RVU in 1986 is well below the range of the allowed charges per RVU of the other specialists and points to a problem with the data for other physicians in 1986. It should probably also be remembered that this other physicians group includes anesthesiologists whose coding has always been problematic. If the problem is with anesthesia coding in 1986, it could also be affecting the problem data identified in Table 35, for surgical and inpatient allowed charges per RVU.

Allowed charges per provider number are the highest for medical procedures ($12,886) and lowest for laboratory procedures ($1,787). Increases in allowed charges per provider number are highest for laboratory services (93%) and lowest for surgical services (28%).

By Place of Service

Over the three years of the study, allowed charges by type of service have been about 35% for office services, 43% for Inpatient Services, 13% for Outpatient Services and 8% for other places of service. The number of services per provider number increased most for other (i.e. lab, SNF, ASC) places of service (102%), followed by Outpatient Hospital (+35%), Office (+24%) and Inpatient Hospital (+14%). RVUs per provider have increased the most for other places (70%) followed by Outpatient Hospital (51%), and Office (27%). Inpatient RVUs per provider number have decreased 10%.

Allowed charges per RVU ranged from a suspiciously low $2.81 for inpatient to $3.96 for office services. The percentage change in allowed charges per RVU shown is 41% for inpatient hospital place of service, 10% for office, 9% for outpatient and -1% for other. This 41% is inconsistent with the 9% reported in Table 13 from the procedure file data. As mentioned previously, while we have no direct evidence, we could speculate that this problem may be connected to the coding of anesthesia services in 1986.

Allowed charges per provider number range from $2,325 for other place of service to $13,286 for inpatient hospital. The rate of increase ranges from 27% for inpatient hospital to 68% for other place of service.

By Level (low, medium, high) of Percent of Allowed Charges Assigned for the Provider Number

Provider numbers were classified in each year by the percentage of their allowed charges that were assigned. Low assignment providers were those who had between 0% and 25% of their allowed charges assigned. Medium assignment providers are those who had between 26% and 75% of their allowed charges assigned. High assignment providers are those who had between 76% and 100% of their allowed charges assigned.

As can be seen in Table 37, there has been a substantial shift in numbers of provider numbers into the high assignment group. In 1986, 48% of the provider numbers were in the high assignment group. By 1988, 61% of the provider numbers were in the high assignment group. The low assignment group decreased from 31% to 23% and the medium assignment group decreased from 21% to 16%. The pattern is similar across all specialty groups.

Table 38 shows the number of services per provider number, number RVUs per provider number, allowed charges per RVU and allowed charges per provider for the low, medium and high assignment providers by specialty. As can be seen in that table, in general the low assignment providers have the smallest number of services, RVUs and allowed charges per provider number. The medium assignment providers on average had larger allowed charges per provider number in 1986 than did the high assignment providers. This is, however, not true for all specialties. (In 1986, general practitioners, medical specialists and other non-physicians high assignment providers had the largest allowed charges per provider number.) Nor is it true for all years. Allowed charges per provider numbers increased most rapidly (53%) for the high assignment providers. Medium assignment providers increased only 10% and low assignment providers allowed charges per provider number actually decreased their allowed

Table 37

NUMBER OF LOW, MEDIUM, AND HIGH ASSIGNMENT PROVIDER NUMBERS, BY SPECIALTY, 1986 - 1988

	1986	1987	1988	% Change
All Provider Numbers	35,050	34,442	35,501	1.3
Low Assignment	10,897	9,900	8,072	-25.9
Medium Assignment	7,286	6,894	5,805	-20.3
High Assignment	16,867	17,648	21,624	28.2
General Practice	6,987	7,014	6,691	-4.2
Low Assignment	2,163	1,951	1,565	-27.6
Medium Assignment	1,741	1,739	1,443	-17.1
High Assignment	3,083	3,324	3,683	19.5
Internal Medicine	5,141	4,949	5,057	-1.6
Low Assignment	1,441	1,231	955	-33.7
Medium Assignment	1,304	1,292	1,114	-14.6
High Assignment	2,396	2,426	2,988	24.7
Medical Specialties	2,609	2,672	2,881	10.4
Low Assignment	729	710	602	-17.4
Medium Assignment	520	473	389	-25.2
High Assignment	1,360	1,489	1,890	39.0
General Surgery	2,060	2,004	1,944	-5.6
Low Assignment	560	482	384	-31.4
Medium Assignment	418	334	231	-44.7
High Assignment	1,082	1,188	1,329	22.8
Surgical Specialties	7,486	7,317	7,477	-0.1
Low Assignment	2,241	1,994	1,569	-30.0
Medium Assignment	1,646	1,546	1,217	-26.1
High Assignment	3,599	3,777	4,691	30.3
Other Physician Specialties	4,761	4,699	4,965	4.3
Low Assignment	1,441	1,367	1,158	-19.6
Medium Assignment	826	768	648	-21.5
High Assignment	2,494	2,564	3,159	26.7
Clinics and Groups	880	662	822	-6.6
Low Assignment	233	140	80	-65.7
Medium Assignment	173	112	101	-41.6
High Assignment	474	410	641	35.2
Other Non-Physician Providers	5,126	5,125	5,664	10.5
Low Assignment	2,089	2,025	1,759	-15.8
Medium Assignment	658	630	662	0.6
High Assignment	2,379	2,470	3,243	36.3

Table 38

NUMBER OF SERVICES PER PROVIDER NUMBER, NUMBER OF RVUs PER PROVIDER NUMBER, ALLOWED CHARGES PER RVU, AND ALLOWED CHARGES PER PROVIDER NUMBER, BY SPECIALTY AND ASSIGNMENT LEVEL, 1986 - 1988

	Services/PN		RVUs/PN		Allowed $/RVU		Allowed $/PN	
	1986	% Change	1986	% Change	1986	% Change	1986	% Change
All Provider Numbers	772	33.1	9,026	13.7	3.23	22.2	29,130	38.9
Low Assignment	581	-19.0	6,523	-23.0	3.20	19.0	20,875	-8.5
Medium Assignment	835	18.0	12,239	-20.4	2.80	37.7	34,259	9.6
High Assignment	869	43.6	9,255	33.5	3.48	14.3	32,247	52.6
General Practice	623	19.3	4,241	14.8	2.92	15.9	12,381	33.1
Low Assignment	597	-30.1	3,707	-27.2	2.90	10.2	10,749	-19.7
Medium Assignment	654	26.7	4,938	0.7	2.56	26.2	12,637	27.1
High Assignment	624	36.0	4,221	36.3	3.17	9.5	13,381	49.2
Internal Medicine	1,243	13.3	8,775	9.7	3.72	14.3	32,604	25.4
Low Assignment	1,187	-38.0	7,238	-31.1	3.80	10.0	27,496	-24.2
Medium Assignment	1,428	9.5	9,622	-0.3	3.76	8.4	36,220	8.0
High Assignment	1,177	33.0	9,238	20.4	3.65	18.1	33,708	42.2
Medical Specialties	1,126	31.2	12,369	34.0	3.92	9.3	48,505	46.5
Low Assignment	817	-13.5	8,150	12.0	3.72	8.3	30,354	21.4
Medium Assignment	1,081	52.3	12,497	27.5	4.16	-0.2	51,943	27.3
High Assignment	1,309	28.9	14,581	30.8	3.90	11.4	56,919	45.8
General Surgery	380	19.2	11,128	16.6	3.46	8.1	38,531	26.1
Low Assignment	312	-20.9	9,936	-13.6	3.39	-2.6	33,676	-15.8
Medium Assignment	471	-3.8	13,349	6.7	3.39	0.2	45,586	6.9
High Assignment	381	34.8	10,852	29.1	3.53	10.0	38,318	42.0

Table 38 (Concluded)

NUMBER OF SERVICES PER PROVIDER NUMBER, NUMBER OF RVUs PER PROVIDER NUMBER, ALLOWED CHARGES PER RVU, AND ALLOWED CHARGES PER PROVIDER NUMBER, BY SPECIALTY AND ASSIGNMENT LEVEL, 1986 - 1988

	Services/PN		RVUs/PN		Allowed $/RVU		Allowed $/PN	
	1986	% Change	1986	% Change	1986	% Change	1986	% Change
Surgical Specialties	417	29.4	9,757	32.3	3.92	3.3	38,228	36.6
Low Assignment	359	-4.6	8,034	-3.1	3.76	-0.9	30,211	-4.0
Medium Assignment	439	15.9	10,846	5.8	3.93	-3.3	42,626	2.3
High Assignment	443	38.5	10,332	45.1	3.99	4.1	41,208	51.0
Other Physician Specialties	766	20.0	15,767	-34.1	1.78	119.1	28,040	44.5
Low Assignment	521	-5.5	11,542	-51.0	1.59	137.4	18,384	16.4
Medium Assignment	1,069	-45.8	37,171	-82.1	1.13	213.6	41,932	-43.7
High Assignment	808	41.9	11,120	16.0	2.61	51.5	29,018	75.7
Clinics and Groups	2,350	47.6	24,522	43.2	3.78	10.2	92,746	57.8
Low Assignment	2,244	52.7	22,893	46.4	4.28	-12.5	97,949	28.1
Medium Assignment	3,592	147.9	40,824	147.4	3.88	7.4	158,412	165.8
High Assignment	1,949	34.3	19,373	28.7	3.42	23.9	66,221	59.6
Other Non-Physician Providers	735	87.9	3,263	78.4	3.57	-7.9	11,640	64.2
Low Assignment	230	34.1	551	33.2	5.74	1.2	3,161	34.9
Medium Assignment	149	46.6	447	127.2	7.18	-31.8	3,211	55.1
High Assignment	1,339	64.1	6,424	48.8	3.33	-5.7	21,416	40.3

charges per provider number by 9%. This pattern was consistent across all specialties except clinics and groups and other non-physician providers. In 1988, high assignment level providers averaged over $49 thousand in allowed charges per provider number.

5. SUMMARY AND POLICY IMPLICATIONS

In this chapter we first summarize our findings and then present implications of our findings for policy formulation.

Summary of Findings

Below we present summaries of technical investigation findings and analytical results.

Technical Investigation Findings

This report used data from the procedure/prevailing and provider files of HCFA's BMAD system to analyze the growth in physician services from 1986 to 1988. Augmenting the BMAD files were data provided by HCFA on Medicare eligibility, users of Medicare services, HMO enrollment, and Medicaid crossover activity.

Eligibility for Medicare over the study period increased 3.4% from 30.4 million person-years in 1986 to 31.5 million person-years in 1988. The percentage of person-years of eligibility with reported use increased from 78% to 80%. Those with Medicaid remained relatively stable at about 10%. Carrier variation in use rates ranged by carrier area from the low sixties to mid-nineties with most hovering around the mean. Medicaid eligibility ranged from less than 1% in Puerto Rico and Wyoming to over 25% in Mississippi.

In order to provide appropriate denominators for the data presented by carrier, we adjusted the eligibility numbers for HMO enrollment and for the amount of border-crossing activity. Border crossers are beneficiaries who have services processed through carriers outside the carrier area in which they reside. Overall, 5% to 6% of Medicare beneficiaries' person-years of eligibility were for times during which they were enrolled in an HMO. Adjustments for HMO eligibility and border-crossing activity ranged from 0 to 54% among the carriers. (Supplemental Table 1, Impact of Adjustments for HMO Beneficiaries, Border Crossers, and Medicaid Crossovers, provides detailed data on these adjustments.)

Provider numbers reported in the provider file range from two-digit numbers to thousands per carrier. Note that this file consists of the claims of a 5% random sample of the provider numbers per carrier. The number of beneficiaries per provider number reported in the data ranges from 151 in 1986 to 215 in 1988.

As part of the process of analyzing and cleaning the data files, we conducted a number of investigations to try to improve the data for use in our analyses. To the extent possible, Level II HCFA-specific codes and Level III local codes were converted to the Level I CPT procedure codes. Level II codes for services represented 2.5% of Medicare allowed charges. Level III codes for services represented 3.5% of Medicare allowed charges.

Efforts were made to identify for analysis surgery-related services that might have been miscoded. Anesthesia services, consultations by surgeons, and surgical services were identified utilizing the broadest possible coding parameters. Problems were found in the correspondence between procedure codes and type of service, as well as in the coding of anesthesia services.

Investigation of the use of modifiers with procedure codes was also conducted. Modifiers can identify procedures with a higher or lower allowed charge or simply provide additional information about the service provided. It is of importance to note the large percentage of allowed charges which are for services that are modified. Thirty-five percent of the allowed charges (34% of the services) are for procedure codes which contained one or more modifiers. Documentation does not exist for a large number of the approximately one thousand modifiers found. Consequently, procedure code modifiers were not considered in this analysis.

Modifier 26 "Professional Component" modifiers used for special diagnostic procedures, radiology procedures, and laboratory procedures were examined in more detail and found to be increasing rapidly over the three-year period. The percentage of special diagnostic procedure codes having a Professional Component Modifier increased from 10% of allowed charges to over 40% of allowed charges. Over half of the radiology procedures and 16% of all laboratory procedures have a Professional Component Modifier in 1988. The change in the use of Modifier 26 may reflect changes in coding rules and/or inconsistent interpretation of the rules. (See Supplemental Table 4, National Allowed Charges With and Without Modifier 26 for Diagnostic Procedure Codes and Groups, for additional information.)

After all the technical investigations were considered, a data file was created for analysis purposes. This file was used to generate the analysis tables. Below we summarize results from these analyses.

Analytical Results

Over the three-year period the data from the BMAD Procedure file show a growth of 16% in number of services per eligible. The gross number of services increased 19% and number of services per user increased 11%. The number of RVUs increased 17% but the number of RVUs per service decreased slightly (-1%). Allowed and billed charges increased 27% and 28% respectively. Allowed and billed charges per eligible increased 23% and 25%. Allowed and billed charges per RVU increased 8% and 9% respectively.

Results varied when the data were disaggregated by carrier, by procedure code, by place of service and by provider specialty. Growth rates were generally higher for carriers in the South and Southwest, for surgical and laboratory services, and for services provided in other places of service and by other specialists.

The allowed charges assigned increased 10 percentage points over the three-year period -- most dramatically for laboratory services, but also for the other procedure groups. Other places of service and other specialties have the largest percentage of their charges assigned in 1988.

The trend experienced in laboratory use over the period of phasing in the fee schedule should be considered. It indicates a small increase (2%) in price; however, this increase is linked to a 5% increase in intensity and a 25% increase in use. These results should make policy makers anxious about the implementation of fee schedules that do not include controls on overall expenditures.

When the data are examined by detailed procedure groupings, different patterns of increases and decreases in the utilization and cost measures emerge. The medical procedures -- second opinions, ophthalmology, allergy, pulmonary, neurology, and dermatology -- have experienced the largest utilization increases. Surgical procedures in the cardiovascular/vascular, ear, male reproductive, nervous, and eye range of procedure codes have experienced the largest surgical procedure increases. Laboratory service increases were noteworthy for chemistry/toxicology, immunology, microbiology and automated tests.

Investigation of individual procedure codes in the office, hospital, and consultation ranges indicated that some upgrading was occurring although the majority of the increase was due to price. Overall $75 million in allowed charges in 1988 are due to increases in the pattern of charges for office visits, hospital visits, and consultations.

Some of the procedures legislated for reimbursement reduction in 1990 because of their overvalue relative to the resource-based relative value scale had substantial growth over the course of our study period. Ophthalmoscopy/angioscopy, knee/arthroscopy surgery, treatment of retinal lesion, disk surgery, cataract surgery, breast surgery and coronary artery bypass all had large increases in use. Selected laboratory tests show dramatic growth in tests related to prevention and monitoring of cardiac and thyroid disease.

For medical procedures, radiology procedures and laboratory procedures, the lists of most common procedures and of the procedures resulting in the largest percentage of allowed charges often contained the same services. The highest volume and highest dollar medical procedures are the two most common office charges (90060 and 90050) and the two most common hospital visit charges (90260 and 90250). Together they account for over 40% of the medical services and over 30% of the medical allowed charges in 1988. Two electrocardiograms and two general ophthalmological services also appear on both lists.

For the radiology procedures, two chest x-rays lead both the services and the charges list. Two ophthalmic biometrics by ultrasound services appear on the top charges list. One of those procedures increased 196% in use over the period.

The most common laboratory procedure is urinalysis (position 1 on services list, position 4 on the charges list). Also very common are variations on the Complete Blood Count (CBC), which represent different combinations of tests and levels of automation. Also of importance to note over the period is the shift to automation, and the dramatic increase in use of tests monitoring cholesterol and cardiac and thyroid tests.

For surgical procedures the top use list included mostly high-volume, low-cost minor surgical procedures and the top charges list included mostly expensive procedures. The two exceptions to this are cataract surgery (66984), which appears in position 6 on the number of services list and in position 1 on the allowed charges list, and venipuncture for the collection of specimen(s) (36415), which appears in position 1 on the top use list and in position 18 on the top charges list. Code number 36415 accounts for almost two-thirds of the increase in number of surgical services.

Our analysis of provider file data showed some of the same general patterns as those observed in the procedure file analysis except in the specific instances where we suspect difficulties with the provider file. The numbers of services and allowed charges seem generally consistent with the numbers reported in the procedure file, except in the third year where they tend to be higher in the provider file than the procedure file. However, average rates of increase of surgical allowed charges per RVU appear to have been affected by miscoding in 1986 of data on allowed charges per RVU for "other" physicians (e.g. radiologists, anesthesiologists). Suspect data are also found for specific carriers [New Jersey, New York (Empire)], and by place of service (inpatient place of service).

The numbers of unique beneficiaries per provider number increased 43% over the three-year study period. The number of provider numbers increased less than 1%. Services per provider number increased 33% and RVUs per provider number increased 14%. RVUs per service declined 15% from 1986 to 1988. This decline is much greater than the 1% found in the procedure file analysis. Allowed charges per RVU increased 22%. This increase was greater then the 8% increase found in the procedure file analysis.

Allowed charges increased 41%, allowed charges per provider number increased 39%. Billed charges increased slightly more than allowed charges, 44% for total and 42% for billed charges per provider number. Allowed charge increases and billed charge increases were 14% and 15% less, respectively, in the procedure file than in the provider file.

Carrier distributions vary with substantially different patterns across the carriers. Allowed charges per provider number ranged from $34,159 in Texas to $68,825 in Pennsylvania in 1986 with increases from 1986-1988 ranging from 10% to almost 40%.

Most of the provider numbers were for surgical specialties, followed by general practice, other non-physician providers, internal medicine, medical specialties, general surgery and clinics and groups. Increases in allowed charges per provider number were smallest for internists and largest for other non-physicians. By procedure code group, allowed charges per provider number increased most dramatically for laboratory services, almost doubling. Surgical allowed charges per provide number increased only a little more than a fourth. By place of service, other places increased the fastest and inpatient services the slowest.

When provider numbers are divided into low, medium and high assignment providers, we find substantial increases in the number of provider numbers moving into the high assignment group. In 1986, the allowed charges per provider number were largest for the medium assignment providers. By 1988, the high assignment providers had the largest allowed charges per provider number.

Policy Implications

Below we present policy implications in two important policy areas of current concern to HCFA. These areas are: the development of the Common Working File (CWF) and the implementation of the OBRA89 Physician Payment Reforms.

Development of the Common Working File

While conducting this study, we identified substantial problems and anomalies with BMAD data. It is difficult to assess which portions of those problems are related to inconsistencies in provider coding practices, carrier processing system differences, or BMAD data translation and preparation functions. Therefore, the impact of converting carrier systems to the Common Working File (CWF) is somewhat problematical, although our technical investigations would suggest that the majority of problems are based in the data sources, not the BMAD process.

The CWF project now underway disperses the function of maintaining HCFA's beneficiary file to nine regional host sites and enhances the file to include more complete and better edited information on each beneficiary. Specifically, the file will contain beneficiary entitlement, utilization, claims payment, and Medicare Secondary Payer (MSP) and HMO data. While the host sites will process and maintain the data, HCFA will receive daily sets of updated data to respond to data requests. The CWF Part B record data will, in effect, replace the current BMAD files (with the exception of the prevailing charges file). Initial CWF activity and emphasis has focused on implementation and operations issues. However, as more and more carrier sites implement CWF, and HCFA takes a closer look at the CWF data file, we would suggest that HCFA might want to integrate into its thinking on this subject some of the lessons we have learned in examining and cleaning BMAD data. We have three recommendations that, if implemented, could result in data files with improved consistency and usability for research purposes.

First, we believe that HCFA, and its goal of consistent application of Medicare program policy, would benefit from the careful development of additional common administrative procedures for both carriers and the provider community. For instance, we noted wide variations on issues such as carrier assignment of provider numbers, and provider use of modifier versus type of service codes to identify the exact nature of billed services. HCFA's mandate to reduce the variety of Part B carrier systems and support a few shared maintenance systems (a BPO initiative), could perhaps provide a suitable vehicle for implementing this recommendation. Expanding common administrative procedures would reduce maintenance costs while addressing HCFA's desire for more consistent data. HCFA's UPIN project to establish uniform provider ID numbers is also addressing this issue.

A second recommendation centers on providing more technical assistance to carriers, specifically focused on accurate carrier preparation and transmission of claims data. While the CWF host site contractors are already required to provide assistance during carrier CWF conversions, their emphasis is on successful systems operations. However, additional emphasis on data quality as an ongoing issue might assist HCFA in attaining one of the CWF goals, improved access to data.

Finally, our data cleaning process identified three specific areas of data coding which require considerable attention if such coded data are to beutilized to any effect in the future. These include use of modifiers, anesthesia coding, and billing for hospital-based physician (HBP) services. It is clear that use of national and local modifiers is both widespread and inconsistent, resulting in the inability of policy makers to accurately interpret substantial portions of HCFA data. The proliferation of local modifiers may need to be subjected to the same controls now being applied to HCPCS Level III codes. National modifiers should be reduced and their application should be made consistent. It is apparent that considerable training of carrier coding and systems personnel may be necessary to insure some uniformity in anesthesia coding. Finally, the billing and payment of HBP services require greater scrutiny. Common carrier systems and quality control procedures for identifying incorrect billings might be introduced, along with provider community education on component billing.

In summary, the transition to the Common Working File might be viewed as an opportunity for HCFA to establish greater control over the quality and uniformity of the data to be made available through this major HCFA system enhancement.

Implementation of the OBRA89 Payment Reforms

The Omnibus Budget Reconciliation Act of 1989 will radically change the way physicians will be paid under the Medicare program. Its implementation is based on the Resource-Based Relative Value Scale (RBRVS) developed by researchers at Harvard.[29] It is composed of three components: the Medicare Fee Schedule (MFS), Volume Performance Standards (VPS) and beneficiary protection. The MFS is calculated for each procedure as the sum of geographically adjusted relative values for the actual work, overhead and malpractice multiplied by a conversion factor. The conversion factor initially is to be set to guarantee budget neutrality. Volume Performance Standards may control the growth in volume and intensity of services. If the growth in services exceeds a fixed percentage, the conversion factor may be reduced in the subsequent year. To minimize beneficiary liability while and after the MFS is being phased in, physicians not accepting assignment will only be allowed to charge Medicare beneficiaries 9.25% above the MFS fee amount for providers.[30] This legislation when fully implemented in 1996 will dramatically affect physician payment. The specifics of its implementation which will be conducted over the next five years are of substantial importance.

We believe that our study has implications for this implementation. First, our data demonstrate that there are substantial differences in the amount and growth of various measures of utilization and cost. Substantial variation exists by procedure group, by place of service and by specialty, and perhaps most importantly, by carrier area. Geographic differences in the number and growth of services were profound over the 1986-1988 period and it is likely these trends continue today. Understanding the current differences by carrier areas is of substantial importance. Adjusting fairly for geographical differences[31] which may rise from very different bases is also an area of great concern.

Second, there will be substantial need for new and better data in the implementation of the new physician payment system. An area which needs to be addressed is the standardization of coding techniques, including local procedure codes, use of modifiers, payment for hospital-based physicians, assignment of specialty codes, and contents of global fees. Also of importance is the timing of the delivery of the data. While we understand that the current 1 1/2 year lag in data availability should be substantially shortened under the Common Working File, to the extent that this improvement does not occur or is delayed, data will not be available for use to effectively monitor the implementation.

Third, it is of great importance how providers, beneficiaries, Medigap, and other insurers react to the new reimbursement methodology. The possibility of increased Medigap-induced demand if Medigap policies tend to increase coverage of deductibles and copayments[32] may greatly affect the complexities of controlling physician costs. In addition as Medicare restricts balanced billing, Medicare beneficiaries may find themselves with more disposable income which might fuel the demand for additional services.

Fourth, how the diffusion of technology advances will be controlled in the new system is of substantial importance. Two rapidly increasing growth rates provide examples in our data. One is coronary artery bypass surgery, three varieties of which, identified in our top charges surgery list, make up 4.4% of surgical allowed charges in 1988. Increased use has been over 30% for all three procedures from 1986-1988. Usefulness of this technology to all those receiving it is an issue of concern. Second is the increased proliferation of lipid measurement. Three lipid measurement laboratory tests appear on the top charges laboratory procedure list making up 5.3% of all laboratory allowed charges in 1988. These three tests have increased in use 100%, over 200% and almost 600% over the three-year period. This is despite the fact that efforts to lower cholesterol in the aged have yet to be demonstrated effective in decreasing their risk of heart attacks.

Fifth, our study has demonstrated the importance of the volume performance standards. The results from implementation of the lab fee schedule demonstrate that without measures to contain overall volume, numbers of services and their intensity will likely continue to increase. Volume performance standards, if properly implemented, can also provide incentives to physicians to collectively identify and eliminate unnecessary care. Research on effectiveness and development of practice guidelines should aid in these efforts.

But if volume performance standards are to have any possibility of success, they will need to be made meaningful to the individual doctor. Rewards or punishments cannot be on such a removed basis that the individual doctor feels helpless to affect the outcome. The more decentralized the volume performance standards, the greater the probability of successful implementation.

What remains of substantial concern in the implementation of the physician reform package outlined in OBRA89 is whether there exist politically viable technical solutions to implementing the Volume Performance Standards. Without volume performance standards with real teeth, we believe the new physician reimbursement package will likely exacerbate rather than moderate the growth in physician expenditures.

NOTES AND REFERENCES

1. Report to Congress: Medicare Physician Payment, Volume and Intensity of Physician Services, Submitted by the U.S. Department of Health and Human Services Health Care Financing Administration, October 1989.

2. Letch, Suzanne, Katherine Levit, and Daniel Waldo, "National Health Expenditures, 1987," *Health Care Financing Review*, 10:2 (Winter 1988), 109-122.

3. Report to Congress: Medicare Physician Payment, Volume and Intensity of Physician Services, Submitted by the U.S. Department of Health and Human Services Health Care Financing Administration, October 1989.

4. Fisher, Charles R., "Physician charges for surgical services under Medicare, by medical specialty: 1980 and 1985," *Health Care Financing Review*, Summer 1988.
   Fisher, Charles R., "Trends in Medicare Enrollee Use of Physician and Supplier Services, 1983-1986," *Health Care Financing Review*, Fall 1988.
   Fisher, Charles R., "Data Compendium on Physicians and other Non-institutional Suppliers," Spring 1989.
   Edwards, Winston O. and Charles R. Fisher, "Medicare physician and hospital utilization and expenditure trends," *Health Care Financing Review*, Winter 1989.
   Impact of the Medicare Fee Freeze on Physician Expenditures and Volumes, Final Report for Cooperative Agreement No. 17-C-98758/1-03 for the Health Care Financing Administration, Center for Health Economics Research , Needham, Massachusetts, December 1988.
   Changes in Medicare Part B Physician Charges: Final Report, Health and Human Services Contract No. 100-85-0053, Mandex, Inc., Springfield, Virginia, October 1988.

5. HCFA BDMS BMAD System 1985-1987, Physician Summary Record, 1980-1984.

6. Latta, Viola B., and Roger E. Keene, "Leading inpatient surgical procedures for aged Medicare beneficiaries, 1987," *Health Care Financing Review*, Winter 1989.

7. Dodds, Greg and Lynn Etheredge, "Trends in Laboratory Testing Under Medicare Part B," *Health Affairs*, Summer 1989.

8. Wakely, J.T., W.C. Eckerman, R.E. Mason, and T.G. Virag, "A Study to Determine Factors Physicians Take Into Consideration in Deciding Whether To Accept Assignment, Billing Arrangements Physicians Make to Cope With the Deductible and Co-Insurance Features of Reimbursement, and the Nature of These Billing Practices," *A Report on the Results of the Study of Methods of Reimbursement for Physicians' Services Under Medicare*, SSA Publication 92-73 (10-73), Department of Health, Education, and Welfare, Health Insurance Benefits Advisory Council, Washington, DC, July 1973.

9. Ferry, T.P., M. Gornick, M. Newton, and C. Hackerman, "Physicians' Charges Under Medicare: Assignment Rates and Beneficiary Liability," Health Care Financing Review, 1, Winter 1987, pp. 49-73.

10. Paringer, Lynn, "Medicare Assignment Rates of Physicians: Their Response to Changes in Reimbursement Policy," Health Care Financing Review, Winter 1980, pp. 75-89.

11. Mitchell, Janet B., and Jerry Cromwell, "Physician Behavior Under the Medicare Assignment Option," Final Report for Contract No. 500-78-0051 from the Health Care Financing Administration, January 30, 1981.

12. Rice, Thomas and Nelda McCall, "Factors Influencing Physician Assignment Decisions Under Medicare," Inquiry, Spring 1983, pp. 45-56.

13. Rodgers, James F., and Robert A. Musacchio, "Physician Acceptance of Medicare Patients on Assignment," Journal of Health Economics, Volume 2, 1983, pp. 55-73.

14. McMillian, Alma, James Lubitz, and Marilyn Newton, "Trends in physician assignment rates for Medicare services, 1986-85," Health Care Financing Review, Winter 1985.

15. Burney, Ira, and Julia Paradise, "Trends in Medicare Physician Participation and Assignment," Health Affairs, Summer 1987, Volume 6, Number 2, pp. 107-120.

16. McMenamin, Peter, "Medicare Part B: Rising Assignment Rates, Rising Costs," Inquiry, Winter 1987, Volume 24, pp. 344-359.

17. Holahan, John, and William Scanlon, "Physician Pricing on California: Price Controls, Physician Fees, and Physician Incomes from Medicare and Medicaid," Health Care Financing Grants & Contract Report, HCFA/HEW Pub No. 03006, 1979.

18. Rice, Thomas and Nelda McCall, "Changes in Medicare Reimbursement in Colorado: Impact on Physicians Economic Behavior," Health Care Financing Review, June 1982, Volume 3, November 4, pp. 64-85.

19. Mitchell, Janet B., Gerard Wedig, and Jerry Cromwell, "The Medicare Physician Fee Freeze: What Really Happened," Health Affairs, Spring 1989, pp. 21-33.

20. Barer, M., R. Evans, and R. Labelle, "Fee Controls as Cost Control: Tales from the Frozen North," The Milbanks Quarterly, 66(1), 1988, pp. 1-104. Lomas, J., C. Fooks, and T. Rice, et al, "Minding our P's and Q's: Simultaneous Control of the Price and Quantity of Physician Services in Canada," Center for Health Economics and Policy Analysis, McMaster University, Department of Health Policy and Administration, submitted for publication, 1988.

21. Nelda McCall, "Utilization of Medicare Services Outside the HMO," Group Health Journal, Summer 1983.

22. Butrica, B., J. Hofman, J. Mitchell, P. Rioux, and J. Schneider, "Summary of Local Code Conversion Process" Health Economics Research, Inc., June, 1990.

23. The one exception to this may be assistant surgeons where reasonable charge policy limits the assistant surgeons fee to 20% of the prevailing charge for the surgical procedure. See Reports to Congress from HCFA, Implementation of a National Fee Schedule, October 1989, p. 18.

24. Holahan, John, and William Scanlon, "Physician Pricing on California: Price Controls, Physician Fees, and Physician Incomes from Medicare and Medicaid," Health Care financing Grants & Contract Report, HCFA/FEW Pub. No. 03006, 1979.
    Rice, Thomas, and Nelda McCall, "Changes in Medicare Reimbursement Rates in Colorado: Impact on Physicians' Economic Behavior", Health Care Financing Review, June 1982.
    Mitchell, Janet B., Gerald Wedig, and Jerry Cromwell, "The Medicare Physician Fee Freeze: What Really Happened," Health Affairs, Spring 1989, pp. 21-33.

25. GAO Report, 4RD-89-128, Medicare Mandatory Assignment.

26. William J. Sobaski, Anne A. Scitovsky and Nelda McCall: The 1969 California Relative Value Studies and Costs of Physician Office Visits: Two Studies, UCSF: Health Policy Program discussion paper, April 1976.

27. Cynthia Brown, Focus on Socio-Economic Issues, American College of Surgeons Bulletin, V75 #1, "Medicare Reimbursement for Overvalued Procedures to be reduced in 1990."

28. Laboratory Fees and their Effect on the Volume of Service, CAPP CARE Bulletin of 1988.

29. Hsiao, W., P. Braun, E. Beker, et. al. A National Study of Resource-Based Relative Value Scales for Physician Services. Cambridge, Mass: Harvard University Publishers, 1988.
    Hsiao, W., P. Braun, E. Beker, et. al. "Resource-Based Relative Values", Journal of the American Medical Association. 1988; 260: 2347-2353.
    Hsiao, W., P. Braun, D. Yntema, E. Beker, "Estimating PHysicians' Work for a Resource-Based Relative Value Scale, New England Journal of Medicine, 1958; 260: 835-841.

30. Levy, Jesse M., Michael J. Borowitz, Stephen F. Jencks, Terrance L. Kay and Deborah K. Williams, "Impact of Medicare Fee Schedule on Payments to Physicians", Journal of the American Medical Association, 1990; 260: 717-722.

31. Welch, P., S. Zukerman, G. Pope, The Geographic Medicare Economic Index: Alternative Approaches. Springfield, VA, National Technical Information Service, 1989.

32. McCall, Nelda, Thomas Rice, James Boismier, and Richard West. "Is There Insurance Induced Demand for Medical Care Services? Evidence from the Medicare Population." HCFA cooperative agreement No. HCFA-17-C-98522/9-02. February 1989.

APPENDIX A

Technical Issues Memos

APPENDIX A
TECHNICAL ISSUES MEMOS

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Technical Issue Memos #13, and #14 and have not been included because they are not applicable to this report.

LAGUNA RESEARCH ASSOCIATES

MEMO #1

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: May 30, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #1: Beneficiary Users and Eligibles
"Denominators" and Adjustments

The following adjustments were made to the BMAD sample user and HI master eligible file denominators.

1. **HMO Adjustment.** We will pro-rate users and eligibles according to the percentage of time that their Part B entitlement was in an HMO. (We will do this by identifying those HICs with HMO indicators and counting the number of months in the HMO.) We should note that because beneficiaries in GP3's can go outside their HMO for services (and the user file reflects that activity), our adjustment will result in a understatement of the denominator.

2. **ESRD Adjustment.** The five percent BMAD file includes people whose terminal HIC digits are either 05, 20, 45, 70, or 95, or those with end stage renal disease. Since the HCFA summary user denominator file we received was created from this file, this is the case with it also. We will exclude the ESRD beneficiaries who would not otherwise be in the sample so that the sample is one representing 5% of the population.

3. **Calculation of the Number of Users Per Carrier.** In order to calculate the number of users per carrier in Table Series 1, we will employ the following methodology. The BMAD sample-derived "user file" provided to us by HCFA, which contains one record for each user in a carrier will be used. If beneficiaries are users in more than one carrier they are represented in each carrier in which they are a user. Thus we need to develop a methodology for allocating their participation among carriers. Our methodology to do this is to weight the percentage of allowed charges processed by that carrier. If a user had charges processed by a single carrier for a given year, that user would be counted as one user for that carrier. If the user had charges processed by multiple carriers, the percentage of the user's charges allowed for the carrier to the user's total allowed charges, would be the portion of a user counted for that carrier. Suppose that one beneficiary has $50 in services, $20 through carrier A and $30 through carrier B. He/she would thus count .4 of a user in carrier A and .6 of a user in carrier B. Because the user file is a 5% sample, the resulting number of users will be multiplied by 20 to get the total number of users per carrier.

4. **Border Crosser Adjustment.** Our methodology for adjusting the number of eligibles for border crossing activity is attached.

Attachment

METHODOLOGY FOR ADJUSTMENT OF NUMBERS OF BENEFICIARIES

Below we describe our proposed methodology for calculating the number of eligibles for each carrier for use in the analyses tables. The number of eligibles per carrier will be calculated for each carrier C by summary across all j carriers who process claims for their eligibles, the number of eligibles physically located in the jth carrier area times the percentage of total allowed charges for eligibles located in the jth carrier area that are reimbursed by the carrier C.

$$N_c = \sum_{j=1}^{z} N_j \cdot \frac{\$c \text{ to } j}{\$T_j}$$

Where: N_c = Adjusted estimate of number of eligibles for carrier C.

N_j = Number of eligibles residing in carrier j.

$\$c$ to j = Allowed charges processed by carrier C to those located in carrier j.

$\$T_j$ = Total allowed charges processed for those located in carrier j.

z = Total number of carriers.

The records which were generated by HCFA in the most recent data transfer (called the "denominator" files) which were runs by the HCFA data staff on the eligibility and BMAD beneficiary file, will be used as the bases for obtaining the data necessary for these adjustments. Two separate file formats were created. One was the "eligibility" data which includes data on 100% of all Medicare beneficiaries and all HMO beneficiaries. The purpose of the transmittal of this file was to provide us with an estimate of the number of eligibles with an ability to remove HMO beneficiaries. The second file transmitted was created from the BMAD beneficiary file, which is all claims of a random 5% sample of beneficiaries (all carriers must select on standard value for random digits of SSI#). The record transmitted to us includes for each beneficiary in the 5% sample information on whether they submitted a claim and whether services were allowed. This provides us data on which we can define various kinds of users. The user data will be run against the "eligibility" data, to omit HMO beneficiaries and get information on "home carrier". Ratios (see above) will be constructed based on the allowed charges in the user file and the numbers of beneficiaries will be adjusted using the ratios constructed according to the technique described above.

To give an example, suppose there are three carriers, A, B, and C with numbers of eligibles as given in Table 1. Further assume that the Allowed Charges per Carrier are distributed as in Table 2. Home Carrier is the carrier of residence. Processing carrier is the carrier that processes the claim. The Adjusted Number of eligibles calculation will be performed as follows for each carrier, A, B, C. The Adjusted Number equals: the Unadjusted Number of eligibles residing in the home carrier area, times the ratio of allowed charges for home carrier A eligibles that were processed by home carrier A to the total allowed charges processed for home carrier A eligibles, plus the unadjusted number of eligibles residing in home carrier B times the ratio of allowed charges for eligibles from the home carrier B that were processed by the carrier A plus the unadjusted number of eligibles residing in home carrier C times the ratio of allowed charges for eligibles from home carrier C that were processed by carrier A. Specifically from Table 2 the Adjusted Number of Eligibles for Carrier A = [10 x (1000/1500)] + [50 x (500/6500)] + [20 x (100/1500)].

We will construct these ratios for all three years of the study, adjusting the number of beneficiaries in each year.

Table 1

Unadjusted Number of Eligibles per Carrier*

Carriers	Unadjusted number of Eligibles (Eligibles residing in carrier area)
A	10
B	50
C	20

* Data Source: Eligibility File

Table 2

Allowed Charges by Carriers where the eligible's home is located and carrier which processed the claim

Actual Processing Carrier

Home Carrier	A	B	C	Total $ Processed for Home Carrier eligibles
A	1000	200	300	1500
B	500	5000	1000	6500
C	100	200	1200	1500

Data Source: User file with HMO Beneficiaries excluded and data on Home Carriers appended.

LAGUNA RESEARCH ASSOCIATES

MEMO #2

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 1, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #2: Relative Value Units (RVUs)

In our ERD, we noted that we would substitute the BMAD files' relative value units with those from the HCFA-supplied HCPCS Tape Description File. Our review of the HCPCS file indicated that the RVU field was not present in all instances. In seeking further information about the source of the RVUs, we learned the following.

The original HCPCS Tape Description file was developed in 1983 for the HCPCS pilot test at Blue Shield of South Carolina. The RVUs inserted for the test were the Florida RVUs. During the test, as South Carolina converted its own coding structure to HCPCS, it identified codes for which there were no relative values. The carrier was instructed to develop RVUs for those codes and insert them in the HCPCS file. At the end of the pilot, the revised HCPCS file contained a mix of Florida RVUs and South Carolina RVUs, although according to HCFA staff involved in the conversion, perhaps less than ten percent of the RVUs were developed by South Carolina. That post-pilot revised file was then sent to all of the carriers to use for their local conversions.

The RVU field has not been updated since the pilot test. Since procedure codes have been added through the years, some RVU fields are blank. To maintain consistency in RVUs, we calculated missing RVUs as follows.

Within each category of service, such as surgery, we totaled the allowed charges and RVUs for all procedures within that category for all three years of the study and calculated the relationship between the two. We then used that factor and the allowed charge for each procedure code without an RVU entry, to calculate the RVU. For example, a surgery procedure code has no RVU assigned. The total allowed surgery charges on the file are $75,000 and the total RVUs for those corresponding surgery codes are 750 units. This represents a conversion factor of $100 per RVU. The surgery procedure code which has no assigned RVU has an allowed charge of $150. Using the conversion factor, we would calculate the RVU for this procedure code as 1.5.

LAGUNA RESEARCH ASSOCIATES

MEMO #3

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 11, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #3: Place of Service Categories for Procedure and Provider File Tables

Our Evaluation Research Design (ERD) proposed that data for Table Series 1 through 4 be arrayed by place of service as follows: total, office, in-patient hospital, out-patient hospital, and other. In our preliminary distribution of data tables, we arrayed all of the place of service coding by nation and individual carrier to determine whether the specific places of service we had identified in the ERD were the most appropriate. Our review of these distributions confirmed our original proposal. National statistics reveal the following percent ranges of allowed charges by place of service for the period 1986-1988.

Place of Service:	% of Allowed Charges:
Office	30.3 - 31.6%
In-patient	37.3 - 40.6%
Out-patient	12.6 - 13.4%

Clearly, these are the primary place of service codes by which we should array data. However, we did examine the next largest percentages by place of service, to see if any of them might be relevant or interesting. We thought that ambulatory surgery centers would reveal some interesting percents, but we found that the range for the national statistics was only 1.6 to 2.4%. It appears from other tables we produced, however, that the place of service for ASC may not have been used very accurately by the carriers during this period, and does not represent a reliable indicator. Therefore, we decided not to highlight ASC services via place code.

The next highest percentage was for laboratory, with the range being 3.0 to 3.3%. However, we thought that we could more easily and accurately identify these services through our laboratory procedure code grouping. Therefore we also rejected laboratory place coding. Finally, we looked at the combination of ECF and SNF place of service codes, which when combined result in less than 2.5% of the total allowed charges. We decided that this category was not large enough to recommend itself for separate table identification.

We have therefore determined that our tables will be produced according to our original ERD proposal, using the following places of service: office, in-patient hospital, out-patient hospital, "other" for everything not within those categories, and total.

LAGUNA RESEARCH ASSOCIATES

MEMO #4

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 12, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #4: HIC Matching Problems

In the process of matching the HCFA beneficiary "eligibility" file with the BMAD Beneficiary 5% "user" File, we noted that there were beneficiaries on the user file who could not be matched to any beneficiary on the eligibility file. This discrepancy did not seem logical to us, since if the beneficiary were a user, his eligibility would have been determined prior to claim payment. We contacted the BMAD staff in BDMS and learned that the discrepancy for the national files is between 2.5 to 3.0%. That is to say, nearly 3.0% of beneficiary HIC numbers contained in the BMAD user files cannot be found on the eligibility file. The BMAD staff indicated that this was a known problem that had never been investigated to determine the exact cause for the discrepancy.

In discussing this further with BMAD staff and among ourselves, we established that the BMAD files are produced by the carriers based on their paid claims records. These paid claims records do not necessarily represent HCFA-accepted payment records, therefore the eligibility and HIC number of the beneficiary in each BMAD record has not necessarily been completely verified by HCFA on a post-payment basis. This means that any changes that have occurred in eligibility or in the HIC number of any given eligible between the time of query by the carrier and the time of submission of the BMAD record to HCFA, would not necessarily be reflected in the BMAD records. BDMS staff in HCFA felt that there were a number of possibilities for explaining the lack of an exact matching HIC between the BMAD file and the denominator file. For example, when a spouse dies, the surviving spouse may have been previously insured under her spouse's SSN in order to receive a higher Social Security payment. However, the new widow may find that she can now receive a higher benefit by being insured under her own personal account and therefore her HIC number changes completely. The process of cross-referring her old HIC number to the new one may take several months and may occur during the period between the initial query by the carrier and the submission of the BMAD record. A second example of a cross-reference problem might be that the beneficiary's BIC changes because of some change in his or her status, and equating one HIC to another that has a different BIC can also take some time and pose some cross-referencing problems.

At any rate, it appears that the most logical assumption, and one that has been made by both LRA and BDMS, based on information we know about the carrier and BMAD process, is that in fact all of the beneficiaries on the user file were probably eligible at the time of payment, and they are most likely represented on our denominator file, but with a different HIC that had not yet been properly cross-referenced at the time of the creation of the files. Therefore, our approach will be to make no changes to either the user file (by excluding those users whose HICs do not appear on the eligibility file), or to the eligibility file. (As a side note, it is useful to realize that the large majority of these mismatch problems should "disappear" as the carriers convert to the Common Working File.)

The fact that we cannot match these users to a record on the eligibility file, creates one other problem for us, i.e. we do not know the county of residence or HMO status of these particular users. We will assume that these users represent a random distribution of beneficiaries, and therefore will utilize the current distribution of counties and HMO eligibility to impute their county and HMO eligibility.

LAGUNA RESEARCH ASSOCIATES

MEMO #5

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 13, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #5: Conversion of HCPCS Level II Codes to CPT Codes for Procedure File and Provider File Tables

In order to include the full scope of physician services that were allowed during the study period, we examined HCPCS Level II coded services to determine which if any represented physician services, whether the volume was significant, and how those services might be included in our procedure code tables. Our initial Carrier Distribution tables revealed that Level II coded services represented $2.6 billion to $3.6 billion in allowed charges in the study period 1986 to 1988. This translates to 10.9% to 11.9% of all allowed charges for the period. In examining the composition of Level II HCPCS codes, however, we determined that only five categories of those codes represented physician services. Attachment 1 displays the HCPCS code ranges and accompanying descriptions. Five of these categories represent physician services. They include the A2000 code for chiropractic, the M codes for medical services, the P codes for laboratory services, the R codes for radiology services, and the T codes for surgical services. These physician services represent about 2.5% of allowed charges for physician services nationally. The following table displays the distribution of those charges in more detail.

Level II codes		Allowed $ Range	% Range
A2000	chiropractor	110 - 138 million	.5%
M	medical	195 - 290 million	.8% - 1.0%
P	laboratory	19.8 - 17.2 million	.08% - .06%
R	radiology	27.6 - 36.0 million	.1%
T	surgery	41.0 - 12.0 million	.2% - .04%

While some of these categories represent very low levels of volume and expenditure, we believe that is useful to include them since they are identifiable by type and can be categorized. We therefore converted all of these Level II services to CPT codes in the following manner. We began with the M codes, since these represented the largest dollar amount and the widest array of medical services. Attachment 2 is a chart displaying the conversion of each M code or group of codes to a specific CPT code or range of codes. In virtually all cases the M codes were convertible to specific ranges of CPT codes in the 90000 series. There were two exceptions in which the M codes appear to convert more accurately to surgery codes, and this was done. Some M codes or code ranges were deleted. These represent codes that were not assigned for national use and for which the BMAD files therefore contain no description. In all cases, these non-described codes (which most likely resulted from carrier mis-coding) represented extremely low or zero volumes and dollars.

The remainder of the Level II physician codes and groups were converted as shown in Attachment 2. Attachment 3 is a list of groupings of CPT-4 procedure codes. An earlier version of this list appeared in our Evaluation Research Design. It reflects groupings of procedure codes that were utilized in performing certain analyses in Table Series 1. You will note that the chiropractic code A2000 has been grouped into the physical medicine grouping of codes 97000 through 97999. Similarly, the HCPCS Level II T codes for surgery have been grouped into the surgery type of service by converting these individual Level II codes into the unused CPT code 69999. HCPCS Level II P codes for laboratory services have been placed in the laboratory grouping under unused CPT code 80000. HCPCS Level II R codes for radiology have been grouped into the radiology segment as code 70000, another unused CPT code. We utilized these Level II conversion tables to insure the inclusion of all physician services in our procedure and provider file tables.

Attachments

Attachment 1

Level II Code Ranges

HCPCS CODE RANGE	DESCRIPTION
A0000-A0999	Ambulance
A2000	Chiropractic
A4000-A4999	Medical and surgical supplies
A9000-A9999	Miscellaneous and experimental supplies and services
B0000-B9999	Enteral and parenteral therapy
D0000-D9999	Dental
E0000-E9999	Durable medical equipment
H0000-H9999	Rehabilitative services
J0000-J9999	Drugs and biologicals
L0000-L9999	Orthotics and prosthetics
M0000-M9999	Medical services
P0000-P9999	Laboratory services
Q0000-Q9999	Temporary codes
R0000-R9999	Radiology and ultrasonography services
T0000-T9999	Surgical services
V0000-V9999	Vision

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Attachment 2

Conversion of Level II HCPCS Physician Codes to CPT Codes

Description	Level II code (range)	CPT code (range)
M codes:		
*	M0001 - M0004	delete
Physical Medicine	M0005 - M0008	97010 - 97039
OV (established)	M0009	90030 - 90099
Home V (subsequent)	M0019	90130 - 90199
*	M0020, M0023	delete
	M0025 - M0028	delete
Hospital V (subsequent)	M0021, M0022 and	90240 - 90299
	M0024, M0029	" "
	M0030 - M0038	delete
Nursing Home V (subsequent)	M0039 - M0049	90340 - 90399 and
		90430 - 90499
ASC Facility Charges	M0050 - M0069	delete
Chemical Therapies	M0070 - M0080	99175 - 99199
*	M0090	delete
Podiatry	M0101	20000 - 29999
*	M0200 - M0259	delete
Tonsillectomy	M0260 - M0261	40000 - 49999
Special Unclassified	M0299	99175 - 99199
IV Chelation Therapy	M0300	90782 - 90800
Cardiovascular	M0399 - M0592	92950 - 93399
*	M0600	delete
Psychological Testing	M0601	90830
*	M0605 - M0700	delete
Osteo: OV	M0702 - M0710	90030 - 90099
Osteo: HV	M0722 - M0730	90240 - 90299
Osteo: Phys Med	M0799	97000 - 97799
*	M0805 - M0899	delete
Vascular Surgery	M0900, M0910	33000 - 37999
Dialysis	M0901 - M0909 and	90941 - 90999
	M0911 - M0994	" "
Other M Codes*		delete
Chiropractic:		
Physical medicine	A2000	97000 - 97999
P codes - Laboratory:	P0000 - P9999	80000
R codes - Radiology:	R0000 - R9999	70000
T codes - Surgery:	T0000 - T9999	69999

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* Codes (or ranges) not in use: services miscoded and extremely low volume.

Attachment 3

GROUPINGS OF CPT-4 PROCEDURE CODES BY TYPE OF SERVICE

Procedure	Type of Service
90000-99099, 99150-99199	Medical**
90000-90029	New Office (V)
90030-90099	Est. Office (V)
90100-90129	New Home (V)
90130-90199	Est. Home (V)
90200-90239	Initial Hospital (V)
90240-90299	Subs. Hospital (V)
90300-90339, 90400-90429	Initial Nursing (V)
90340-90399, 90430-90499	Subs. Nursing (V)
90500-90529	New Emergency (V)
90530-90599	Est. Emergency (V)
90600-90649	Consultations (V)
90650-90698	Second Opinions (V)
90699	General Medical (V)
90700-90749	Immunization Injections (O)
90750 and 90760	Preventive Medicine (V)
90782-90800	Injection (O)
90801-90940	Mental Health (V)
90941-90999	Dialysis (P)
91000-91299	Gastroenterology (P)
92000-92499	Ophthalmology (P)
92500-92949	Special Otorhinolaryngologic (P)
92950-93399	Cardiovascular (P)
93400-94999	Pulmonary (P)
95000-95199	Allergy (P)
95819-95999	Neurology (P)
96500-96549	Chemotherapy Injections (P)
96900-96999	Dermatology (P)
97000-97799	Physical Medicine (P) and Chiropractic (HCPCS Level II code A2000)
99000-99002	Specimen Collection (O)
99013-99015	Telephone Calls (O)
99024-99065, 99150-99174	Special Physician (V)
99070-99071	Supplies (O)
99075-99099	Administrative/Other (O)
99175-99199	Special Services (O)

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* The letter in parenthesis after the description indicates which of the three main kinds of service -- (V) visit, (P) procedure, (O) other -- a particular range of medical codes represents.

** Medical groups and subgroups include converted Level II "M" codes with minor exceptions noted under surgery subgroups. Converted Level III codes may be included in any procedure code range, based on the HER conversion (see Technical Memo #11).

Attachment 3 (Concluded)

GROUPINGS OF CPT-4 PROCEDURE CODES BY TYPE OF SERVICE

Procedure	Type of Service
95200-95818	Code Ranges Not Used
96000-96499	Code Ranges Not Used
96550-96899	Code Ranges Not Used
98000-98999	Code Ranges Not Used
10000-69999	Surgery
10000-19999	Integumentary
20000-29999	Musculoskeletal (includes M0101)
30000-32999	Respiratory
33000-37999	Cardiovascular/Vascular (includes M0900 and M0910)
38000-38999	Hemic/Lymphatic
39000-39999	Mediastinum/Diaphragm
40000-49999	Digestive (includes M0260-M0261)
50000-53999	Urinary
54000-55979	Male Reproductive
55980-58999	Female Reproductive
59000-59999	Maternity
60000-60999	Endocrine
61000-64999	Nervous
65000-68999	Eye
69000-69998	Ear
69999	HCPCS Level II "T" Codes
00100-01999, 99100-99140	Anesthesia (Not Approved for Medicare Use)
80000-88999	Laboratory
80000	HCPCS Level II "P" Codes
80001-80999	Automated Tests
81000-81999	Urinalysis
82000-84999	Chemistry/Toxicology
85000-85999	Hematology
86000-86999	Immunology
87000-87999	Microbiology
88000-88999	Pathology
89000-89999	Miscellaneous
70000-79999	Radiology
70000	HCPCS Level II "R" Codes
70001-76999, 78000-78999	Diagnostic
77000-77999, 79000-79999	Therapeutic

LAGUNA RESEARCH ASSOCIATES

MEMO #6

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 20, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #6: Surgery Related Services (Table Series 2)

Table Series 2 was designed to address the interest that was expressed by ORD in the pattern of surgical billings and billings for services related to surgery. Surgery does constitute a procedure group that is addressed throughout the tables. However, this group is based on procedure codes and encompasses only surgical procedures per se. To address ORD's concerns, in addition to this basic surgical procedure data, we created the special categories in Table Series 2 to reflect as much of the activity around surgery as is possible by identifying surgeries, surgical procedures, services for assistant surgeons, consultations by surgeons, and anesthesia procedures. Our methodology included any Level II or Level III codes that could be converted to procedure codes within these groups of services listed above. Attachment 1 is a table which displays in summary form the logic utilized to select data for each grouping in Table Series 2. This memo describes in more detail the methodology we followed to identify and array the data associated with these surgery related services.

The first area of concern was for procedures that reflect surgeons and assistant surgeon activity, or some kind of surgical procedure. In reviewing the Carrier Distribution Tables, we observed that surgery TOS 2 accounts for approximately 31% of allowed charges. A separate table displaying charges by physician specialty codes reflected the same percentage when combining the charges associated with all of the surgical specialty codes. The figures for assistant surgery TOS 8, however reflect a very low number of 1.3 to 1.1% of allowed charges. A quick review of assistant surgery modifier codes 80, 81, and 82, reflects a combined total of only 0.6% of allowed charges. In short, the assistant surgery data is less consistent. While assistant surgery billings should reflect both an assistant surgeon modifier and TOS code 8, these initial statistics would indicate that this correlation is not appearing consistently within BMAD data. Discussions with HCFA regional office and carrier staff also indicate that patterns of billing for assistant surgeons vary. Modifier codes may be missing, and the type of service code may be missing, incorrect, or not correctly input by carrier staff to the carrier claim record. We attempted to identify assistant surgery activity by selecting the surgical procedure codes with TOS = 8 for assistant surgeons or modifiers = 80, 81, or 82. The remaining surgical procedure codes are divided into those with TOS = 2 (surgery) and surgical procedure codes which do not have TOS = 2, i.e. were probably miscoded for TOS. (See Attachment 1, Groupings 2 and 3.)

Our second grouping of procedures relates to consultations. Billing practices and coding systems present several difficulties in identifying all consultations relating to surgery. CPT consultation code series 90600 through 90649 represent consultations of any kind, not necessarily those related to surgery. HCFA has identified special modifiers SF, YY and ZZ for denoting second (and third) surgical opinions. However, our initial data reflects extremely low usage of these modifiers (0.0% of allowed charges for SF and ZZ, and 0.007% for YY). This low utilization may reflect an actual low volume of second and third opinions, or the failure on the part of either the biller or the carrier to provide the modifier in the claim record. We therefore decided to identify consultations performed by surgeons, and for surgeries, in the following manner. We selected all consultation procedure codes 90600 through 90649, and second opinion procedure codes 90650 to 90698 that were billed by surgical specialties, and procedure codes with the three second (or third) surgical opinion modifiers SF, YY and ZZ, and procedure codes with the two surgical opinion TOS codes Y and Z.

The third area of surgery-related services is that of anesthesia. A review of basic billing practices by anesthesiologists is helpful in understanding the BMAD data. A typical anesthesia billing should include a CPT surgical procedure code in the 10000 to 69999 range (HCFA did not allow Medicare billers to utilize the CPT anesthesia code range of 00100 to 01999, and 99100 to 99140 until 3/1/89), the amount of time for the anesthesia service, and TOS code 7. The surgical procedure code might also include modifiers P1 through 6, or modifiers AB, AC, and AD, and their local code counterparts, to reflect use of CRNAs. (Modifiers 23 and 47 from the CPT book were not authorized for use in Medicare.) In processing these anesthesia line items, carrier systems assign various units to the codes. For instance, the CPT code itself will have an anesthesia base value represented in units. (Unfortunately, during the period of study, base value units associated with each surgical code were not consistent nationally among the carriers.) Modifier codes may or may not add additional units to the base value. Finally, the amount of time of the anesthesia procedure is converted by quarter hours into additional units. As a result, the total anesthesia procedure would result in a combination of base value, modifier, and time units. Theoretically, information about each of these types of units would be transferred from the carrier record to HCFA through BMAD in the following way. The "base unit" field would reflect the number of base units associated with the service. The "MTUS" field would reflect the total number of units associated with the amount of time for the procedure. The "initial modifier unit" field would reflect the number of units associated with the modifier for this procedure. Finally, the "MTUS indicator field" would reflect indicator 2 for anesthesia time units, or indicator 6 for anesthesia base and time units when they are combined.

Unfortunately, the BMAD Data Limitations documents clearly reflect the fact that many of the carriers had difficulty in transferring their billing information to these BMAD categories. This problem, combined with the fact that base value units varied by procedure code among the carriers, results in the inability to draw any conclusions about the units information provided in the various BMAD fields.

In an attempt to identify and display all anesthesia services, regardless of the accuracy or completeness of the billing and/or BMAD record, we utilized a wide variety of fields and separated the services into groupings. In the first more accurate grouping, we searched for CPT surgical procedure code and anesthesia specialty 05, or TOS 7, or the presence of anesthesia modifiers P1 through P6. If the surgical procedure code was not accompanied by TOS 7 or an anesthesia modifier, but did reflect MTUS indicator 2 or 6, we assumed this was probably an anesthesia service, and separated it into another grouping. (See Attachment 1, Groupings 5 and 7.)

Finally, you have indicated a special interest in the occurrence or use of CRNAs performing anesthesia services under the supervision of anesthesiologists. Since 1983, HCFA has required that these services be identified through special modifiers, so that carriers can appropriately reimburse these services at a lower rate. The standard national modifiers are AB, AC, and AD. However, we have also learned that some carriers utilized the special local modifier codes QH, QI, QJ, QK, QL, and QM, to indicate use of CRNAs to perform anesthesia. Although this structure was not universal, and in fact the modifier QH was utilized by some carriers to denote certain oxygen billings, we can assume that the use of these Q modifiers with surgical procedure codes would denote anesthesia services performed by CRNAs or anesthesiologist employees. We have been advised, however, that anesthesiologists have not necessarily been consistent in their billing practices, particularly in following the use of the prescribed CRNA modifiers. We are therefore anticipating that the volume of BMAD CRNA records may not reflect the actual level of CRNA utilization.

Attachment

Revised 8/28/90

Attachment 1

SPECIAL SURGERY-RELATED SERVICES GROUPINGS

	GROUPING	LOGIC
1.	Assistants at Surgery	MTUS Indicator = 3, and CPT Surgical procedure codes 10000-69999 and converted level II and III HCPCS codes, with TOS = 8, or modifier codes 80, 81, or 82.
2.	Surgical Procedures (TOS = 2)	MTUS Indicator = 3, and Surgical procedure codes (as above), and was not in group 1, and TOS = 2.
3.	Surgical Procedures: Residual (TOS does not equal 2)	MTUS Indicator = 3, and Surgical procedure codes (as above), and was not in group 1 or 2 or 4.
4.	Consultations by Surgeons	CPT procedure code 90600-90649 or 90650-90698, with provider specialty = surgical specialty. or Procedure code with modifier SF, YY or ZZ. or Procedure code with TOS = Y or Z (MTUS Indicator = 3 in all cases).
5.	Anesthesia Services, non-CRNAs	MTUS Indicator = 2 or 6, and Surgical procedure code (as above) and any one of the following: Physician specialty = 05, or TOS = 7, or Modifier = P1-P6.
6.	CRNAs Performing Anesthesia	MTUS Indicator = 2 or 6, and Surgical procedure code (as above), with modifier = AB, AC,AD, QH, QI, QJ, QK, QL, or QM.
7.	Probably Anesthesia	MTUS Indicator = 2 or 6, and Surgical procedure Code (as above), and was not in group 5 or 6.

LAGUNA RESEARCH ASSOCIATES

MEMO #7

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 14, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #7: Analysis of Selected Laboratory Procedures: Table Series 3

Our original proposal listed twenty frequent laboratory tests that might reflect a greater intensity of growth than others during the study period. These 20 laboratory tests, which are displayed in Attachment 1, were selected by Ed Zalta, MD, for analysis in his article entitled, "Laboratory Fees and Their Effect on Volume of Service," published in the CAPP CARE bulletin of 1988. All of these tests were common tests in the Los Angeles area under study, and can be performed in the office. Most of them are generally performed as automated tests.

One problem with utilizing these 20 selected tests is the articles's failure to explain how the list of tests was arrived at and why certain tests were selected and others were not. For example, chemistry panel 15 and chemistry panel 24 were selected but chemistry panel 18 was not. Further research which would involve in-depth communication with pathologists, laboratory administrators, physicians, and HCFA laboratory quality assurance experts (activity which is outside of the scope of our current funding), would be required to be able to determine what the identified tests most likely represent with respect to national billing data on the Medicare population.

During the 1986-1988 period of our study, there were three allowable methods for billing laboratory work under the Medicare program. In the first option, a physician could perform laboratory services within his office and bill for the laboratory work himself. In the second option, the physician could draw a specimen and send the specimen to an independent lab, which would bill for the service. The physician would bill only for drawing the specimen. (Since 1985, physicians have not been allowed to bill for lab work performed in an independent lab. Physicians could only bill for lab services performed within the physician's office.) In the third option, the physician would simply send the patient to an independent lab, which would draw the specimen, perform the procedure, and bill for the entire laboratory service.

In an attempt to assess the frequency of these different types of billing arrangements during the study period, we looked at the Carrier Distribution Tables. They show that the CPT 80000 range of laboratory codes represents 6% of all allowed charges. The place of service (POS) table shows that 3% of total allowed charges were billed with POS independent laboratory. This would indicate that perhaps half of all lab services were performed in physician offices and the other half in laboratories.

Attachment

Attachment 1
Selected Laboratory Tests

CPT CODE	DESCRIPTION
85730	APPT PLASMA
80072	ARTHRITIS PANEL
82250	BILIRUBIN, TOTAL
86080	BLOOD GROUPING
84520	BUN
85022	CBC
80016	CHEM PROFILE 15
80019	CHEM PROFILE 24
80062	CORONARY RISK PANEL
87060	CULTURE, THROAT
80004	ELECTROLYTE PANEL
86002	FEBRILE AGG COMP
82951	GLUCOSE TOL 3 SPECIMENS
82952	GLUCOSE TOL EA ADDITIONAL
82954	GLUCOSE TOL (urine)
80061	LIPID PANEL
85580	PLATELET COUNT
85610	PROTHROMBIN TIME
80070	THYROID PANEL
81000	URINALYSIS

LAGUNA RESEARCH ASSOCIATES

MEMO #8

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 25, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #8: Use of Modifiers with Procedure Codes

Our initial Carrier Distributions tables reflecting use of modifier codes with procedure codes indicate that carriers utilize literally hundreds of modifier codes; however, relatively few of these codes are actually standard national codes. Furthermore, a large percentage of the non-standard codes do not correspond to any description on the BMAD file, and therefore are impossible to categorize. As to frequency of use of modifiers, the expanded distribution tables for allowed charges and services reflecting primary or secondary modifiers (Attachment 1, Supplemental Table 3) indicate that 26% to 35% of allowed charges for the study period are associated with procedure codes that contained a primary modifier. This represents 21% to 33% of the service volumes.

A closer examination of the individual modifier codes in the initial national tables indicates that very few stand out in terms of the percentage of allowed charges associated with them. Of those that do, some are not relevant to our study, others represent information which we are unable to utilize. Examples of this are as follows: modifiers for rental DME, representing 1.3% of allowed charges; reduced services at 0.5%; greater than usual services at 0.5%; multiple services at 1.0%; left side at 1.1%; and bilateral at 0.4%. The use of these modifiers may increase or decrease the amount of dollars allowed by a carrier for a given service, thereby affecting the ratio of allowed charges to relative value units for that procedure. We believe this impact could be significant; however there is no straightforward way to adjust for the effect of these modifiers because we do not have enough information to formulate a correction methodology. Therefore we will not attempt to utilize modifier codes in our analysis of procedure codes. An example of how modifiers may be affecting patterns of allowed charges, however, may be the use of the "professional component" modifier number 26.

Our initial national statistics for utilization of modifier 26 reflected the following trend with respect to allowed charges and percent of total allowed charges:

Professional Component Modifier 26 Usage

1986	1987	1988
$1.2 billion	$2.4 billion	$3.1 billion
4.95%	8.6%	10.2%

We then examined the percent of allowed charges figures for a combination of modifier 27 and modifier TC, both of which are national standard modifier codes for technical component. The figures for those combined modifiers for the same three years are as follows: 0.1% to 0.07% to 0.17%. There is no consistent correlation between the use of these two modifiers during this period.

We then began to examine how these technical and professional component modifiers would ordinarily be utilized in billing practices. The professional component modifier code 26 is used when billing for purchased diagnostic services, i.e., radiology services in the CPT 70000 series, laboratory services in the CPT 80000 series, and selected diagnostic procedures in the CPT 93000, 94000, and 95000 series. We therefore developed an additional Supplemental Table 4, "National Allowed Charges With and Without Modifier 26" (see Report Attachment 1). It revealed that the highest proportions of allowed charges with modifier 26 were the radiology and special diagnostic procedures.

Both ORD and LRA performed investigations to determine whether there were any significant statutory, regulatory, or billing changes that occurred during the study period that might affect the use of these modifier codes. In fact, the TEFRA hospital based-physician (HBP) changes which required that HBP's bill their professional component directly to carriers are most probably being reflected by the data. According to the Regional Office, physicians were slow to adopt correct billing practices. (Using a modifier 26 results in carrier pricing per a lower charge schedule.) Carrier systems for detecting incorrect billings also vary.

For instance, Transamerica Occidental assigns specific provider numbers for providers who only bill professional components. Therefore, their billed procedures do not contain modifiers at all, because the carrier utilizes the specially assigned provider numbers to perform its pricing function. Blue Shield of California uses an edit routine that identifies billings with place of service code in-patient or out-patient for diagnostic procedure codes, and if the procedure code is not modified by a 26, such a modifier is automatically inserted by the system and utilized for pricing purposes. We would assume from this information that various practices of these kinds might be utilized by a variety of carriers across the nation, with no consistent pattern in any of them and furthermore, we have no information about how consistently this information is passed on to BMAD.

LAGUNA RESEARCH ASSOCIATES

MEMO #9

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 20, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #9: Physician Specialty Codes and Groupings

The BMAD system provides specialty codes 00-99 for reporting physician specialties. In our initial production of procedure code tables, we displayed allowed charges and service volumes associated with each specialty code that appeared on the file per carrier and nationally. Our ERD, however, proposed to display this data within the table shells by four groupings of physician specialties, namely: General Practice, Medical specialties, Surgical specialties, and Other specialties. In reviewing the data from our first table run, we saw no reason to deviate from our ERD proposal of four subgroupings. The only remaining question was how to group the BMAD specialties into these four categories. As in our ERD, we are recommending that we utilize the AMA groupings that were provided earlier to us by ORD. Attachment 1 provides a crosswalk between each BMAD specialty code and description to one of the four AMA groupings. We followed the same approach as the AMA in categorizing the specialties.

Attachment

Revision 6/22/90

Attachment 1

HCFA BMAD PHYSICIAN SPECIALTY CODES CATEGORIZED BY AMA GROUPINGS*

HCFA Code	BMAD Description	AMA Group
00	Carrier Wide	O
01	General Practice	GP
02	General Surgery	S
03	Allergy	M
04	Otology/Laryngol/Rhinol/Ophthalmol	S
05	Anesthesiology	O
06	Cardiovascular Disease	M
07	Dermatology	M
08	Family Practice	GP
09	Gynecology (Osteopaths)	S
10	Gastroenterology	M
11	Internal Medicine	M
12	Manipulative Therapy (Osteopaths)	O
13	Neurology	O
14	Neurological Surgical	S
15	Obstetrics (Osteopaths)	S
16	OB-Gynecology	S
17	Ophthalmol/Otol/Laryngol/Rhinol(Osteo)	S
18	Ophthalmology	S
19	Oral Surgery (Dentists)	O
20	Orthopedic Surgery	S
21	Pathol Anatomy, Clinical Pathol (Osteo)	O
22	Pathology	O
23	Periph Vascular Disease, Surgery (Osteo)	S
24	Plastic Surgery	S
25	Physical Medicine and Rehabilitation	O
26	Psychiatry	O
27	Psychiatry, Neurology (Osteopaths)	O
28	Proctology	S
29	Pulmonary Disease	M
30	Radiology	O
31	Roentgenology, Radiology (Osteopaths)	O
32	Radiation Therapy (Osteopaths)	O
33	Thoracic Surgery	S
34	Urology	S
35	Chiropractor, Licensed	O
36	Nuclear Medicine	O

Attachment 1 (concluded)

HCFA BMAD PHYSICIAN SPECIALTY CODES CATEGORIZED BY AMA GROUPINGS*

HCFA Code	BMAD Description	AMA Group
37	Pediatrics	M
38	Geriatrics	M
39	Nephrology	M
40	Hand Surgery	S
41	Optometrist	O
48	Podiatry - Surgical Chiropody	S
49	Miscellaneous (Inc ASCS)	O
70	Clinic, other group practice except GPPP	O
71	Diagnostic X-Ray (group practice)	O
72	Diagnostic Laboratory (group practice)	O
73	Physiotherapy (group practice)	O
74	Occupational therapy (group practice)	O
75	Other Medical Care (group practice)	O
99	Unknown (inc social workers psych svcs)	O

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* GP = General Practice
M = Medical Specialties
S = Surgical Specialties
O = Other

LAGUNA RESEARCH ASSOCIATES

MEMO #10

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: June 20, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #10: Selected Procedure Code Groupings

In our ERD, we proposed to highlight special groups of procedures within various tables. Attachment 1 displays groupings of CPT-4 procedure codes, by type of service. (This table was previously sent in Technical Issues Memo #5, regarding Level II code matching by type of service.) This attachment shows how procedures were grouped by major type of service and displayed for purposes of Table Series 1. Likewise, individual subgroups of procedures are displayed in Table Series 3. Both converted Level II and Level III codes are included in the code ranges listed in Attachment 1. Refer to Technical Issues Memos #5 and # 11 for details.

Table Series 3 also highlights other subgroups of procedures, listed in Attachment 2. These combinations of procedure codes are adapted from an article provided by ORD, on Medicare reimbursement for "overvalued" procedures. Those selected procedures have been fleshed out to include like procedures within the same range; procedure groups with very low volume and allowed charges were deleted.
Attachments

Attachment 1

GROUPINGS OF CPT-4 PROCEDURE CODES BY TYPE OF SERVICE

Procedure	Type of Service
90000-99099, 99150-99199	Medical**
90000-90029	New Office (V)
90030-90099	Est. Office (V)
90100-90129	New Home (V)
90130-90199	Est. Home (V)
90200-90239	Initial Hospital (V)
90240-90299	Subs. Hospital (V)
90300-90339, 90400-90429	Initial Nursing (V)
90340-90399, 90430-90499	Subs. Nursing (V)
90500-90529	New Emergency (V)
90530-90599	Est. Emergency (V)
90600-90649	Consultations (V)
90650-90698	Second Opinions (V)
90699	General Medical (V)
90700-90749	Immunization Injections (O)
90750 and 90760	Preventive Medicine (V)
90782-90800	Injection (O)
90801-90940	Mental Health (V)
90941-90999	Dialysis (P)
91000-91299	Gastroenterology (P)
92000-92499	Ophthalmology (P)
92500-92949	Special Otorhinolaryngologic (P)
92950-93399	Cardiovascular (P)
93400-94999	Pulmonary (P)
95000-95199	Allergy (P)
95819-95999	Neurology (P)
96500-96549	Chemotherapy Injections (P)
96900-96999	Dermatology (P)
97000-97799	Physical Medicine (P) and Chiropractic (HCPCS Level II code A2000)
99000-99002	Specimen Collection (O)
99013-99015	Telephone Calls (O)
99024-99065, 99150-99174	Special Physician (V)
99070-99071	Supplies (O)
99075-99099	Administrative/Other (O)
99175-99199	Special Services (O)

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* The letter in parenthesis after the description indicates which of the three main kinds of service -- (V) visit, (P) procedure, (O) other -- a particular range of medical codes represents.

** Medical groups and subgroups include converted Level II "M" codes with minor exceptions noted under surgery subgroups. Converted Level III codes may be included in any procedure code range, based on the HER conversion (see Technical Memo #11).

Attachment 1 (Concluded)

GROUPINGS OF CPT-4 PROCEDURE CODES BY TYPE OF SERVICE

Procedure	Type of Service
95200-95818	Code Ranges Not Used
96000-96499	Code Ranges Not Used
96550-96899	Code Ranges Not Used
98000-98999	Code Ranges Not Used
10000-69999	Surgery
10000-19999	Integumentary
20000-29999	Musculoskeletal (includes M0101)
30000-32999	Respiratory
33000-37999	Cardiovascular/Vascular (includes M0900 and M0910)
38000-38999	Hemic/Lymphatic
39000-39999	Mediastinum/Diaphragm
40000-49999	Digestive (includes M0260-M0261)
50000-53999	Urinary
54000-55979	Male Reproductive
55980-58999	Female Reproductive
59000-59999	Maternity
60000-60999	Endocrine
61000-64999	Nervous
65000-68999	Eye
69000-69998	Ear
69999	HCPCS Level II "T" Codes
00100-01999, 99100-99140	Anesthesia (Not Approved for Medicare Use)
80000-88999	Laboratory
80000	HCPCS Level II "P" Codes
80001-80999	Automated Tests
81000-81999	Urinalysis
82000-84999	Chemistry/Toxicology
85000-85999	Hematology
86000-86999	Immunology
87000-87999	Microbiology
88000-88999	Pathology
89000-89999	Miscellaneous
70000-79999	Radiology
70000	HCPCS Level II "R" Codes
70001-76999, 78000-78999	Diagnostic
77000-77999, 79000-79999	Therapeutic

Attachment 2

COMBINATIONS OF SELECTED LIKE PROCEDURES

CPT Procedure Code Range	Group
19120 to 19240	Breast Surgery
27120 to 27138	Hip Surgery
28290 to 28299	Bunion Correction
29870 to 29889	Knee Arthroscopy/Surgery
32440 to 32545	Lung Removal
33200 to 33232	Pacemaker Surgery
33510 to 33528	Coronary Artery Bypass
35001 to 35162	Artery Repair
35301 to 35381	Rechannelling of Artery
44120 to 44160	Colon/Intestine Surgery
45355 to 45385	Colonoscopy
47600 to 47620	Removal of Gallbladder
49505 to 49590	Hernia Repair
52500 to 52650	Transurethral Surgery
58150 to 58285	Hysterectomy
62295 to 63076	Disk Surgery
64702 to 64721	Nerve Revision
66800 to 66999	Cataract Surgery
67208 to 67228	Treatment of Retinal Lesion
76700 to 76775	Echo Exam of Abdomen
92225 to 92260	Opthalmoscopy/Angioscopy
93000 to 93045	ECG/Stress Tests
93501 to 93535	Heart Catheterization

LAGUNA RESEARCH ASSOCIATES

MEMO #11

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall
Howard Marantz

DATE: June 25, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #11: Conversion of Level III HCPCS Codes

In order to determine how best to accommodate Level III coding data within the procedure and provider file tables, we examined the following variety of Level III data: 1) HCFA-prepared statistics on local code usage for the years 1985 through 1988, displayed by nation, region, and individual carriers, including frequencies, allowed charges, and percents of charges to totals; 2) HER's (Jan Mitchell) reports (February 9, 1990 and June 18, 1990) on the local code conversion process, and accompanying tables; and 3) LRA-prepared national and carrier summary totals of allowed charges and services units for Level III codes. In analyzing this available data and determining how best to use it in our tables, our goal was to strike a balance between using as much of the data as possible, while insuring an acceptable level of accuracy and meaning to the data selected, given the Table Series data elements and procedure code breakouts.

With these considerations in mind, the only Level III data utilized were the individual Level III codes that HER was able to convert to a specific Level I or Level II code. (We did not include those codes that could only be converted to a type of service [TOS].)

We believe that utilizing HER's most current individual code conversions results in capturing the large majority of physician services, while at the same time insuring a certain level of accuracy in doing so. We determined not to attempt to incorporate Level III codes that HER was only able to convert to type of service, because this poses several problems. First, these codes could only be included in certain tables within our proposed series, since the TOS crosswalk would not allow us to correlate these codes to the many subgroupings of code ranges that we have selected for use in Table Series 3. Second, the type of service correlations would also make it difficult to appropriately calculate RVU conversion factors as specifically as we had hoped to do for other subgroups in our tables. In fact, we view this RVU issue as a problem with the individually converted Level III codes that the study refers to as "problem codes," wherein an exact one-for-one match cannot be made, but is "forced" through a logical determination process. But while this may result in some distortion of the RVUs for these codes, we do not believe that this would be significant enough to cause us to not utilize these particular converted codes. Therefore, our conclusion was to utilize what we judged to be the most meaningful portions (for our purposes) of the converted data for both the procedure and provider file tables.

This judgment, however, has resulted in the exclusion of what may be significant amounts of data for some carriers, because of the limitations of the data itself. A single example highlights this issue. Minnesota Travelers is the carrier that processes claims for the Mayo Clinic. The clinic utilized local codes for what appears to be a substantial portion of its services. Code W9555 is an example. Its descriptor is "Medical, Surgical, Anesthesia, Mayo Clinic Summary." In 1988, this single code was billed for 800,000 series. Because the description is so generic, however, the HER study was understandably unable to convert the code to either Level I or Level II. This code and the services and charges it represented, were therefore excluded from our study tables. Had the code been able to be converted, however, another data limitation would have presented itself. According to BDMS, this code was underreported on BMAD in 1986 by perhaps $50 million (no exact figures were available). This single example, therefore, emphasizes the limitations imposed by the continued use of poorly described or non-specific local codes.

LAGUNA RESEARCH ASSOCIATES

MEMO #12

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall
Howard Marantz

DATE: June 26, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #12: Calculation of Denominators and Impact of Adjustments (Supplemental Table 1)

Supplemental Table 1 presents detailed data by nation and carrier on the number of eligibles, users, and Medicaid Crossovers, and the impact of adjusting those numbers for HMO membership and border crossing activity.

The descriptions for the cells for each table entry are as follows:

#	Explanation	
(1)	Number of eligibles, no adjustment*	
(2)	Number of eligibles, HMO adjustment	
(3)	Number of eligibles, HMO and border crossing adjustment	
(4)	Number of users, no adjustment*	
(5)	Number of users, HMO adjustment	
(6)	Number of Medicaid crossovers, no adjustment*	
(7)	Number of Medicaid crossovers, HMO adjustment	
(8)	Number of Medicaid crossovers, HMO and border crossing adjustment	
(9)	% adjustment on eligibility number	1-(3)÷(1)
(10)	% adjustment on user number	1-(5)÷(4)
(11)	% of Medicaid crossovers (unadjusted)	(6)÷(3)
(12)	% of Medicaid crossovers (adjusted)	(8)÷(3)

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* Note that the number of "unadjusted" eligibles, users and Medicaid crossovers represents person years; i.e., each eligible and user was counted according to the number of months (% of the year) that beneficiary was actually eligible for Part B; each Medicaid crossover beneficiary was counted according to the number of months (% of the year) for which (s)he had been "Bought In" by the state for Medicaid.

LAGUNA RESEARCH ASSOCIATES

MEMO #15

TO: Nancy McCall

FROM: Nelda McCall
Sande Kiriluk

DATE: August 3, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #15: Specifications for BMAD Provider File Analysis

This revised memo is in direct response to HCFA's recently expressed preference for receiving data per beneficiary, and per provider number levels of assignment instead of the Lorenz curves that were proposed in LRA's ERD and subsequently approved by ORD. The following discussion defines the specifications for a new table shell with revised variables for the provider file analysis.

1. Because the data sources are the same for both the provider file and the procedure file, the files share a majority of the same data elements, and we saw nothing in our provider file distributions that would suggest otherwise, we will adopt the same assumptions for the provider file regarding which services to include in the analysis. Therefore we will select services with both "MTUS Indicator = Services," and the physician-related procedure codes, i.e. CPT-4 codes plus the Level 2 and 3 codes that were successfully mapped to them. This approach will result in excluding all non-physician services from the file, but including all physician services. (Refer to our Technical Memos #5 and #11 on the conversion processes.)

2. Because the provider file is so much larger in size than the procedure file, we must limit the number of variables in the tables (see item 6 below).

3. Attachment 1 is a proposal for a new core table. We took another look at the categorizations of specialties that we utilized for the procedure file analysis, and are recommending a consideration of expansion to eight categories. These are defined and assigned to each of the BMAD specialties per the table in Attachment 2. NOTE: We have grouped the gerontologists with the internists.

4. In response to ORD's interest in categorizing provider numbers in terms of the percent of allowed charges that were assigned, the standard variable of "Assignment Status" has been redefined for the provider file tables. The standard indicators of "assigned" and "non-assigned" relate to the status of individual claims and line items. Instead, we will utilize a measurement that results in a provider number relationship, as opposed to a claim relationship. Specifically, we will accrue allowed

charges per provider number into two categories, assigned and non-assigned. We will then calculate the ratios of these charges to the provider number's total allowed charges to determine what percent of charges allowed for that provider number were assigned. Based on those percents we will categorize each provider number into one of three quartile-related categories: Low Assignment Level (0 to 25% of allowed charges were assigned), Medium Assignment Level (26% to 75% of allowed charges were assigned), and High Assignment Level (76% to 100% of allowed charges were assigned). These categories are defined in item 6 below as LA, MA, and HA.

5. Each of the items in the core table are defined as follows:

(1) # of PN: number of unique provider #s for that specialty .

(2) # of beneficiary/provider number combinations: number of unique HIC numbers for that specialty. Each beneficiary/provider number combination is considered a unique beneficiary, which results in a duplicated count of beneficiaries. Utilizing an unduplicated count of only unique beneficiaries has a negative impact on (3) below.

(3) # of beneficiaries per provider #: (2) ÷ (1)

(4) Total services: total number of services from claims data for that procedure group, assignment level, place, specialty.

(5) Total services per PN: (4) ÷ (1)

(6) Total services per beneficiary/provider # combination: (4) ÷ (2)

(7) Total RVUs: total number of RVUs from converting procedure number to uniform RVUs described in Technical Memo #2 (using the data in the HCPCS Tape Description File), for that procedure group, assignment level, place, specialty.

(8) Total RVUs per PN: (7) ÷ (1)

(9) Total RVUs per beneficiary/provider # combination: (7) ÷ (2)

(10) Total allowed charges: from claims files for that procedure group, assignment level, place, specialty.

(11) Allowed charges per PN: (10) ÷ (1)

(12) Allowed charges per beneficiary/provider # combination: (10) ÷ (2)

(13) Total billed charges: from claims files for that procedure group, assignment level, place, specialty.

(14) Billed charges per PN: (13) ÷ (1)

(15) Billed charges per beneficiary/provider # combination: (13) ÷ (2)

6. As indicated in item 2 above, the size of the provider file forces limits on the number and combinations of variables we can consider for tables. The following is the approach we discussed at our meeting. The combinations are presented according to the following categories:

Procedure Group, Provider Assignment Level, POS, Specialty

Group 1 = Totals with Single Variable Change

T, T, T, T
M, T, T, T
S, T, T, T
R, T, T, T
L, T, T, T

T, LA, T, T
T, MA, T, T
T, HA, T, T

T, T, OF, T
T, T, IH, T
T, T, OH, T
T, T, O, T

T, T, T, GP
T, T, T, I
T, T, T, MS
T, T, T, GS
T, T, T, SS
T, T, T, OP
T, T, T, CG
T, T, T, ON

Subtotal = 20 tables

Group 2 = Specialty by Procedure Group

M, T, T, GP
S, T, T, GP
R, T, T, GP
L, T, T, GP

Repeat for all specialties

Subtotal = 32 tables

Group 3 = Specialty by Provider Assignment Level

T, LA, T, GP
T, MA, T, GP
T, HA, T, GP

Repeat for all specialties

Subtotal = 24 tables

Group 4 = Procedure Group by Place of Service (only print Medical Services)

M, T, Of, T
M, T, IH, T
M, T, OH, T
M, T, O, T   Repeat for all procedure groups and place of service

Subtotal = 16 tables

Total = 92 tables

Attachment

Revised 8/28/90

Attachment 1

NUMBER OF PROVIDER NUMBERS, BENEFICIARY/PROVIDER NUMBER COMBINATIONS, SERVICES, RVUs,ALLOWED CHARGES AND BILLED CHARGES NATIONAL AND BY CARRIER, 1986-1988

Procedure Group: Total, Medical, Surgery, Radiology, Laboratory

Provider Assignment Level: Total, Low Assignment, Medium Assignment, High Assignment

Place of Service: Total, Office, Inpatient Hospital, Outpatient Hospital, Other

Specialty: Total, General Practice, Internists, Medical Specialties, General Surgery, Surgical Specialties, Other Physicians, Clinics/Groups, Other Non-Physicians

	Year 86	Year 87	Year 88	% Change
#PN				
#BENP				
#BENP/PN				
TOTAL SERVICES				
SERVICES PER PN				
SERVICES PER BENP				
TOTAL RVUs				
RVUs PER PN				
RVUs PER BENP				
TOTAL AL CHARGES				
AL CHARGES PER PN				
AL CHARGES PER BENP				
TOTAL BILLED CHARGES				
BILLED CHARGES PER PN				
BILLED CHARGES PER BENP				

Attachment 2

HCFA BMAD PHYSICIAN SPECIALTY CODES CATEGORIZED BY SPECIAL GROUPINGS FOR BMAD PROVIDER FILE ANALYSIS

HCFA Code	BMAD Description	Grouping*
00	Carrier Wide	8
01	General Practice	1
02	General Surgery	4
03	Allergy	3
04	Otology/Laryngol/Rhinol/Ophthalmol	5
05	Anesthesiology	6
06	Cardiovascular Disease	3
07	Dermatology	3
08	Family Practice	1
09	Gynecology (Osteopaths)	5
10	Gastroenterology	3
11	Internal Medicine	2
12	Manipulative Therapy (Osteopaths)	6
13	Neurology	6
14	Neurological Surgery	5
15	Obstetrics (Osteopaths)	5
16	OB-Gynecology	5
17	Ophthalmol/Otol/Laryngol/Rhinol(Osteo)	5
18	Ophthalmology	5
19	Oral Surgery (Dentists)	8
20	Orthopedic Surgery	5
21	Pathol Anatomy, Clinical Pathol (Osteo)	6
22	Pathology	6
23	Periph Vascular Disease, Surgery (Osteo)	5
24	Plastic Surgery	5
25	Physical Medicine and Rehabilitation	6
26	Psychiatry	6
27	Psychiatry, Neurology (Osteopaths)	6
28	Proctology	5
29	Pulmonary Disease	3
30	Radiology	6
31	Roentgenology, Radiology (Osteopaths)	6
32	Radiation Therapy (Osteopaths)	6
33	Thoracic Surgery	5
34	Urology	5
35	Chiropractor, Licensed	8
36	Nuclear Medicine	6

Attachment 2 (Concluded)

HCFA BMAD PHYSICIAN SPECIALTY CODES CATEGORIZED BY SPECIAL GROUPINGS FOR BMAD PROVIDER FILE ANALYSIS

HCFA Code	BMAD Description	Grouping*
37	Pediatrics	1
38	Geriatrics	2
39	Nephrology	3
40	Hand Surgery	5
41	Optometrist	8
48	Podiatry - Surgical Chiropody	5
49	Miscellaneous (Inc ASCS)	8
70	Clinic, other group practice except GPPP	7
71	Diagnostic X-Ray (group practice)	7
72	Diagnostic Laboratory (group practice)	7
73	Physiotherapy (group practice)	8
74	Occupational therapy (group practice)	8
75	Other Medical Care (group practice)	7
99	Unknown (inc social workers psych svcs)	8

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* 1 = General Practice
2 = Internists
3 = Medical Specialists
4 = General Surgery
5 = Surgical Specialties
6 = Other, Physicians
7 = Physician Clinics/Groups
8 = Other, Non-Physicians

LAGUNA RESEARCH ASSOCIATES

MEMO #16

TO: Nancy McCall

FROM: Sande Kiriluk
Nelda McCall

DATE: August 13, 1990 (Updated August 28, 1990)

RE: Technical Issues Memo #16: Detail Level Provider File Selection and Categorization Criteria

As we are finalizing our specifications for the Provider File tables, we have made certain determinations about which records to include in our tables. Two decisions related to the "processing indicator" and "provider specialty."

Each line item in the provider file has a processing indicator which can reflect one of six values: allowed, both allowed and denied, denied, adjusted, MSP (Medicare Secondary Payor) conditional payment, MSP actual payment, and "other." Since a primary emphasis in the provider file table series is on allowed charges, we decided to delete those line items which were partially or totally denied. More extensive investigation of BMAD data limitations also led us to delete the "adjusted" lines since some carriers submit supplemental adjustments as required, while others do not have the capability and therefore submit full replacement claims. (Furthermore, we had no way of relating these adjustments to their original submissions.) Since the "other" category was a complete unknown and represented an insignificant volume, these were also deleted.

Finally, we researched the meaning of the MSP categories. "Conditional" payments can be made, then adjusted as "final" payments months or even years later when the final reconciliation with the MSP source (e.g., workers' compensation, casualty insurer, etc.) is made. Since we had no way of linking the conditional and final payments, and because we could not differentiate allowed from denied services represented by these payments, we decided to delete these line items also.

In summary, we are selecting provider file line items with the "allowed" processing indicator only. This results in our utilizing an average 84% of all provider file line items. The large majority of deleted line items were coded as "denied." One major exception involves a data limitation problem. During 1988, data reported for all the states processed by Massachusetts Blue Shield (New Hampshire, Vermont, Maine, and Massachusetts) contained incorrect MSP indicators. Consequently, the provider Table Series 6 displays the underreported non-MSP-coded data for each of these states, but the data for these states has been excluded from the national total data, to avoid distortion of the overall data.

As for provider specialty, we observed that provider numbers appeared on the file with multiple specialties. (Providers may request a carrier to change the specialty designation on their provider file record at any time, but each provider number on the file can only reflect a single specialty at a time.)

For purposes of categorizing these provider numbers, we rejected the option of creating a separate record for each provider number/specialty combination (this would have resulted in duplicated counts.) Instead, we chose to assign to each provider number the specialty which accounted for the highest amount of allowed charges for that provider number.

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